

deforestation\n00:03:40.480 occurred and trees were replaced with\n00:03:42.319 concrete leading to the average\n00:03:44.159 temperature of the region to rise\n00:03:45.680 dramatically however in recent years\n00:03:48.000 there has been a resurgence of greenery\n00:03:49.599 within the city\n00:03:50.879 this has been an attempt to reduce the\n00:03:52.400 heat island effect within the city\n00:03:53.840 centre which is incredibly important\n00:03:55.680 with the overall climate getting warmer\n00:03:58.080 as we experience singapore is incredibly\n00:04:00.319 hot however the use of greenery and\n00:04:02.799 water features at the street level help\n00:04:04.799 keep us cool\n00:04:06.879 this greenery has been transferred into\n00:04:08.560 the architectural designs of the\n00:04:09.920 buildings\n00:04:11.599 the park royal hotel on pickering was\n00:04:13.840 designed as a hotel and garden the\n00:04:16.000 project has won numerous awards for\n00:04:17.759 sustainable and green efforts including\n00:04:19.759 the bca green mark platinum which is\n00:04:21.918 singapore's highest green rating the\n00:04:24.160 building reinforces singapore's tropical\n00:04:26.320 image and enhances the quality of life\n00:04:28.240 of its guests\n00:04:29.520 it does this by providing spaces where\n00:04:31.440 the guests can completely immerse\n00:04:32.960 themselves within nature\n00:04:34.800 it can also benefit those who are simply\n00:04:36.720 walking by and admiring the building\n00:04:40.080 even the concrete has been shaped to\n00:04:41.680 resemble natural forms the designers at\n00:04:44.080 woha refer to this as topographical\n00:04:46.000 architecture the stratified undulating\n00:04:48.240 layers of precast concrete wrap around\n00:04:50.400 the entire building and resemble the\n00:04:52.240 structure of the bedrock\n00:04:54.160 this shows that nature can not only be\n00:04:55.840 used for practicality and efficiency but\n00:04:57.840 can also be used as a design inspiration\n00:05:01.759 not far from this building is the oasia\n00:05:03.680 hotel which is a building entirely\n00:05:05.680 wrapped in a red skin\n00:05:07.440 this allows plants to grow in\n00:05:09.120 the facade in total the building hosts\n00:05:11.520 54 species of plants and trees which\n00:05:14.000 help improve the biodiversity within the\n00:05:16.000 city\n00:05:16.560 [Music]\n00:05:17.759 the 190 metre tall building has large\n00:05:20.320 sections cut out which break up the\n00:05:22.080 facade and allow cross-ventilation into\n00:05:24.320 the building\n00:05:26.639 these garden spaces act as mini oasis in\n00:05:29.840 the center of the busy business district\n00:05:33.759 overall the green facade totals over 25\n00:05:36.880 000 square meters\n00:05:38.800 and the plot of land the building sits\n00:05:40.720 on is only 2 500 square meters\n00:05:44.240 this means the building achieves an\n00:05:45.680 overall greenery replacement of more\n00:05:47.280 than 10 times the site area this will\n00:05:49.680 help address the huge loss of green\n00:05:51.280 spaces within the urban city center\n00:05:54.880 like other living facades it works with\n00:05:56.639 an enormous lung which generates oxygen\n00:05:59.039 and absorbs co2\n00:06:01.520 it is also able to filter out dust fumes\n00:06:04.479 and pollution from the air\n00:06:07.120 the most famous tourist attraction\n00:06:08.800 within singapore is the super trees\n00:06:11.039 within the gardens by the bay\n00:06:13.520 the man-made structures are designed to\n00:06:15.280 emulate the biological behavior of trees\n00:06:18.080 at their trunks at information plucks\n00:06:19.840 which teach the public on the importance\n00:06:21.520 of trees for our survival\n00:06:24.160 the 18 super trees within the gardens\n00:06:26.160 incorporate technologies such as cooling\n00:06:28.080 channels which help moderate the\n00:06:29.680 temperature of the surrounding\n00:06:30.720 environment they also

hold photovoltaics\n00:06:33.199 to harvest energy for the evening light\n00:06:34.880 show\n00:06:36.479 ultimately singapore showcases fantastic\n00:06:38.800 examples of green architecture however\n00:06:41.199 it has been blessed with a climate which\n00:06:42.960 allows for plants to grow rapidly\n00:06:45.680 over in hamburg germany they are taking\n00:06:47.840 a more scientific approach to green\n00:06:49.440 architecture\n00:06:51.120 they are using algae and the process of\n00:06:53.120 photosynthesis to turn the sun's energy\n00:06:55.280 into fuel\n00:06:57.360 the algae rapidly grows within the glass\n00:06:59.360 panels it is then extracted and put into\n00:07:01.919 a bio-converter which turns the algae\n00:07:04.080 into biomass\n00:07:05.840 this biomass can then be used for a\n00:07:07.520 number of things it can be a source of\n00:07:09.520 food for humans or animals and it can\n00:07:11.599 even power cars but the main purpose is\n00:07:14.080 to create electricity and heat for the\n00:07:15.680 people living in the building\n00:07:18.000 whilst we were there we were told the\n00:07:19.440 process was actually producing so much\n00:07:21.280 energy that it can offer electricity to\n00:07:23.440 the surrounding buildings too\n00:07:26.319 finally my favorite green building that\n00:07:28.080 i visited on my travels was in\n00:07:29.520 copenhagen denmark\n00:07:31.280 here they are engaging the public\n00:07:32.800 directly with the energy sector\n00:07:34.960 this has been achieved by placing a ski\n00:07:36.800 slope on top of the cleanest waste\n00:07:38.400 energy power plant in the world\n00:07:40.639 we took the glass lift to the top which\n00:07:42.720 showed us inside the factory where 440\n00:07:45.120 000 tons of waste is being converted\n00:07:47.360 into clean energy annually\n00:07:49.520 once you reach the top you see the\n00:07:51.199 toxin-free steam being released which is\n00:07:53.440 said to be as fresh as mountain air\n00:07:55.680 you then see the start of one of the\n00:07:57.280 world's largest artificial ski slopes\n00:08:00.160 this building has shown that creating a\n00:08:02.000 sustainable future doesn't have to be\n00:08:03.759 limiting it can actually make our lives\n00:08:05.840 more enjoyable\n00:08:07.759 the architect jacques ingles hopes that\n00:08:09.840 this project will inspire those across\n00:08:11.520 the world to create architecture that\n00:08:13.440 can be both fun and save the environment\n00:08:17.039 green architecture does propose some\n00:08:18.879 problems however all of which have\n00:08:21.039 solutions\n00:08:22.240 it can lead to additional costs of\n00:08:23.840 construction but in the long term it can\n00:08:26.000 save a lot of money due to the greatly\n00:08:28.000 reduced air conditioning\n00:08:30.319 vegetation also adds more weight to the\n00:08:32.479 structure however if incorporated in the\n00:08:34.799 original designs this shouldn't be an\n00:08:36.799 issue\n00:08:37.679 as it is organic matter it can propose a\n00:08:40.080 fire hazard however as long as the\n00:08:41.919 irrigation system keeps the vegetation\n00:08:44.000 well watered this shouldn't be a problem\n00:08:47.200 my takeaways from this trip is that\n00:08:48.880 green architecture can be implemented\n00:08:50.720 pretty much anywhere i expect to see\n00:08:53.200 green architecture be used a lot more in\n00:08:55.120 the future to help with both pollution\n00:08:57.120 issues but also to help resolve climate\n00:08:59.279 change\n00:09:00.880 climate change is an issue which will\n00:09:02.480 affect us all however we have the\n00:09:04.480 technology right now to prevent these\n00:09:06.320 horrific scenes from continuing so we\n00:09:08.560 must urge our governments to act and\n00:09:10.640 make sure that they use these\n00:09:11.839 technologies which are already having a\n00:09:13.600 positive

Impact around the world\n00:09:16.399 i hope that you\n00:09:27;ve enjoyed this video on\n00:09:18.240 the world&\n00:09:20.320 want to see more interesting\n00:09:21.519 architecture\n00:09:22.399 be sure to watch my smart buildings\n00:09:23.920 video and also subscribe to see where\n00:09:26.160 i&\n00:09:27;ll be visiting in the future\n00:09:28.160 thank you and i will see you in the next\n00:09:29.839 video\n\nThe file is too long and its contents have been truncated.\n", "title": "tactiq-free-transcript--dvFb2vC7_Y.txt", "tether_id": null}, {"status": "finished_successfully", "end_turn": null, "weight": 1.0, "metadata": {"command": "context_stuff", "is_visually_hidden_from_conversation": true, "message_type": null, "model_slug": "gpt-4o", "default_model_slug": "gpt-4", "parent_id": "805e489a-cbdf-4ded-b0df-2e13000fa6a4", "request_id": "88fdb010afbe5244-MXP", "timestamp_": "absolute"}, "recipient": "all", "channel": null}, {"parent": "805e489a-cbdf-4ded-b0df-2e13000fa6a4", "children": [{"f8a08125-54e9-4f57-bd2a-aaf73a3d6509"}], "f8a08125-54e9-4f57-bd2a-aaf73a3d6509": {"id": "f8a08125-54e9-4f57-bd2a-aaf73a3d6509", "message": {"id": "f8a08125-54e9-4f57-bd2a-aaf73a3d6509", "author": {"role": "tool", "name": "myfiles_browser", "metadata": {}}, "create_time": 1717732352.756771, "update_time": null, "content": {"content_type": "text", "parts": ["\nPlease remember to search the user&\n00:09:27;s documents if an answer to their question is not contained in the above snippets.\n"]}, "status": "finished_successfully", "end_turn": null, "weight": 1.0, "metadata": {"is_visually_hidden_from_conversation": true, "message_type": null, "model_slug": "gpt-4o", "default_model_slug": "gpt-4", "pad": "AAA", "parent_id": "8b708d35-f56f-453b-884b-clf60f26764c", "request_id": "88fdb010afbe5244-MXP", "timestamp_": "absolute"}, "recipient": "all", "channel": null}, {"parent": "8b708d35-f56f-453b-884b-clf60f26764c", "children": [{"dfade6e4-9a51-43eb-be59-1c4e90bcb9de"}], "dfade6e4-9a51-43eb-be59-1c4e90bcb9de": {"id": "dfade6e4-9a51-43eb-be59-1c4e90bcb9de", "message": {"id": "dfade6e4-9a51-43eb-be59-1c4e90bcb9de", "author": {"role": "assistant", "name": null, "metadata": {}}, "create_time": 1717732352.756812, "update_time": null, "content": {"content_type": "text", "parts": ["In high-density urban environments, the management of human waste presents a significant challenge, contributing to environmental pollution and posing health risks. However, innovative closed-loop systems, such as those converting human waste into electricity and fertilizer, offer a sustainable solution. One notable example of this is the implementation of anaerobic digesters in urban settings, which transform waste into biogas and nutrient-rich fertilizer, thus addressing the environmental, social, and economic impacts of waste management.\n\nAnaerobic digesters utilize microbial processes to break down organic waste in the absence of oxygen, producing biogas that can be used for electricity and heat. This technology exemplifies the equilibrium between natural and technological systems. The closed-loop nature of this system ensures that waste is continuously recycled, reducing landfill use and methane emissions. Moreover, the byproduct, digestate, can be used as a high-quality fertilizer, closing the nutrient loop and promoting sustainable agriculture within urban areas (Bringezu & Bleischwitz, 2009).\n\nImplementing anaerobic digestion in urban planning could set a new gold standard for waste management. The cost-benefits of this technology are substantial. The energy produced from biogas can significantly reduce urban energy costs, while the digestate can offset the need for synthetic fertilizers, providing an economic advantage to urban agriculture initiatives. Additionally, reducing wastetransportation and landfill dependency further lowers costs and environmental impacts. However, initial setup costs and the need for public acceptance pose barriers. Public awareness campaigns and government incentives, such

as grants and subsidies for initial infrastructure development, are crucial for overcoming these obstacles (Mang & Haggard, 2016; Hunt, 2020). Governmental support through incentives is vital to spur the adoption of anaerobic digestion systems. Policies that provide tax credits for renewable energy production and subsidies for sustainable waste management infrastructure can drive the widespread implementation of this technology. Furthermore, integrating anaerobic digestion into urban waste management regulations can ensure consistent and long-term use, promoting broader acceptance and standardization (Gibbons, 2020). In conclusion, transitioning to anaerobic digestion systems for managing human waste in urban settings not only addresses significant environmental and economic challenges but also aligns with a regenerative approach to urban planning. By moving away from traditional capitalist models towards more communal and sustainable resource management methodologies, cities can enhance their resilience and sustainability, ensuring a healthier environment and improved quality of life for their inhabitants.

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Could you repurpose the above so that it discusses how these systems could benefit areas with large homeless encampments and people living while experiencing a lack of shelter and having access to bathrooms etc. Like engage it organically through out the discussion and point out how more collectivist and communal resource

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distribution systems could eradicate problems like homelessness"]}, "status":
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"text", "parts": ["In high-density urban environments, not only does the management of
human waste present significant environmental and health challenges, but it also
exacerbates social issues, such as homelessness. Innovative closed-loop systems,
particularly anaerobic digesters, offer a sustainable and potentially transformative
solution to these intertwined challenges. These systems convert human waste into
electricity and fertilizer, providing a unique opportunity to address both sanitation
issues and the broader socio-economic problems associated with large homeless
populations.\n\nAnaerobic digesters utilize microbial processes to break down organic
waste in the absence of oxygen, producing biogas that can be used for electricity and
heat, and digestate, a nutrient-rich byproduct used as fertilizer. This technology
creates a balance between natural and technological systems and can be particularly
beneficial in areas with large homeless encampments, where access to traditional
sanitation facilities is limited. By installing mobile or community-based anaerobic
digesters, not only can the environmental impact of untreated human waste be mitigated,
but these facilities can also provide localized energy sources and contribute to urban
agriculture initiatives, promoting self-sufficiency and sustainability within
underserved communities (Bringezu & Bleischwitz, 2009).\n\nIntegrating anaerobic
digestion into urban planning could revolutionize waste management and significantly
impact social structures by providing much-needed resources in areas plagued by
homelessness. The cost-benefits of this technology extend beyond environmental impacts
to substantial social improvements. The energy produced can offer a reliable power
supply to areas without stable electricity, while the use of digestate can support
community gardens, which provide food and employment opportunities to homeless
individuals. Moreover, the reduction in waste transportation and landfill use lowers
overall urban expenses, allowing for reallocation of funds to social services and
housing initiatives. However, challenges such as initial setup costs and societal
acceptance remain. Addressing these through public awareness and targeted governmental
incentives\u2014grants, subsidies, and policy support\u2014is crucial for widespread
adoption and success (Mang & Haggard, 2016; Hunt, 2020).\n\nGovernmental support
through incentives like tax credits for renewable energy production and subsidies for

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sustainable infrastructure is essential. Such policies could be specifically tailored to encourage the use of anaerobic digesters in areas impacted by homelessness, aligning with broader efforts to combat urban poverty and homelessness. By embedding these systems within urban waste management regulations, cities can foster more inclusive, resilient, and sustainable environments (Gibbons, 2020).

In conclusion, transitioning to anaerobic digestion systems for managing human waste not only mitigates significant environmental and economic challenges but also provides a pathway to address the crisis of homelessness through more communal and sustainable resource management methodologies. This shift from traditional capitalist models to systems that emphasize collective well-being and resource equity can greatly enhance urban resilience, improve public health, and ultimately ensure that all city inhabitants, regardless of their housing status, live in a healthier and more supportive environment.

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["&quot;items&quot;:[&quot;paper_title&quot;:&quot;Accelerating the Deployment of
Anaerobic Digestion to Meet Zero Waste Goals.&quot;;&quot;abstract&quot;:&quot;The U.S.
places approximately 53% of its total municipal solid waste (MSW) in landfills, but
state and local governments across the country are now setting ambitious environmental
and waste diversion policies requiring, among other things, diversion and utilization
of organics. Municipalities across the U.S. are employing anaerobic digestion (AD) as
part of their strategy to divert organic MSW from landfills, produce biogas, and yield
other beneficial coproducts such as compost and fertilizer. However, AD faces many
technical, regulatory, and economic barriers to greater deployment, including upstream
waste contamination, local odor and air pollution concerns, lengthy siting and
permitting processes, and requirements and sizable costs for interconnecting to the
electric grid. We identify a combination of scientific, operational, and policy
advancements that are needed to address these
barriers.&quot;;&quot;paper_authors&quot;:[&quot;Andrew J. Satchwell&quot;;&quot;C.
Scown&quot;;&quot;Sarah J. Smith&quot;;&quot;Jahon Amirebrahimi&quot;;&quot;Ling
Jin&quot;;&quot;T. Kirchstetter&quot;;&quot;N. Brown&quot;;&quot;C.
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technology&quot;;&quot;consensus_paper_details_url&quot;:&quot;https://consensus.app/p
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&quot;;&quot;search_result_number&quot;:1}], {&quot;paper_title&quot;:&quot;Life cycle
assessment of energy from waste via anaerobic digestion: a UK case
study.&quot;;&quot;abstract&quot;:&quot;Particularly in the UK, there is potential for
use of large-scale anaerobic digestion (AD) plants to treat food waste, possibly along
with other organic wastes, to produce biogas. This paper presents the results of a
life cycle assessment to compare the environmental impacts of AD with energy and
organic fertiliser production against two alternative approaches: incineration with
energy production by CHP and landfill with electricity production. In particular the
paper investigates the dependency of the results on some specific assumptions and key
process parameters. The input Life Cycle Inventory data are specific to the Greater
London area, UK. Anaerobic digestion emerges as the best treatment option in terms of
total CO2 and total SO2 saved, when energy and organic fertiliser substitute non-
renewable electricity, heat and inorganic fertiliser. For photochemical ozone and
nutrient enrichment potentials, AD is the second option while incineration is shown to
be the most environmentally friendly solution. The robustness of the model is
investigated with a sensitivity analysis. The most critical assumption concerns the
quantity and quality of the energy substituted by the biogas production. Two key
issues affect the development and deployment of future anaerobic digestion plants:
maximising the electricity produced by the CHP unit fuelled by biogas and to defining
the future energy scenario in which the plant will be
embedded.&quot;;&quot;paper_authors&quot;:[&quot;S. Evangelisti&quot;;&quot;P.
Lettieri&quot;;&quot;D. Borello&quot;;&quot;R.
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elimination of contaminant upstream, the plant never reached the expected treatment capacity, suffering high solid sedimentation in digester, pump clogging, low biogas production and high fraction to be landfilled. Biotec successfully revamped the plant by applying BTA Hydromechanical pre treatment. Similar results have been achieved with the revamping of Ca del Bue in Verona Italy and Burgos in Spain. Castelleone -ITco-digestion plant started in 2010 and is authorized to treat 100.000 t/y (20.000 t/y of biowaste, 6.000 t/y of commercial residues, 6.000 t/y of agricultural substrates and 68.000 t/y of manure), generating 1.676 kWel and producing approx. 100.000 t/y of digestate, successfully used as fertilizer after proper sanitation. In this paper the above mentioned plants are presented.

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Vitali], paper_publish_year: 2012, publication_journal_name: [Consensus paper details url: https://consensus.app/papers/anaerobic-digestion-municipal-solid-waste-biowaste-gandolfi/188bcc9c60cb5489b1bb6e1624a86309/?utm_source=chatgpt&doi:10.5071/20THEUBCE2012-

2DV.3.31, volume: 1468-1472, search_result_number: 4, paper_title: Environmental sustainability of anaerobic digestion of household food

waste. abstract: Consumers are the leading producers of food waste (FW) in developed countries and the majority of household FW is still embedded in general waste where it is incinerated or landfilled. There is increasing awareness in the value of collecting FW as a separate waste stream for production of compost or recovery of energy through anaerobic digestion (AD). This study focuses on AD to evaluate the life cycle environmental sustainability of recovering energy and fertilisers from household FW in the UK. The analysis is carried out for two different functional units: i) treatment of 1 tonne of FW, which is compared to incineration and landfilling; and ii) generation of 1 MWh of electricity, which is compared to other electricity generation options. The former results in net negative greenhouse gas (GHG) emissions (-39 kg CO₂-eq./t) and primary energy demand (-2 fGJ/t) due to the displacement of grid electricity and mineral fertilisers. AD has lower impacts than both incineration and landfilling across 15 of the 19 impacts. However, the application of digestate to land and the release of ammonia and nitrates lead to higher marine eutrophication (ME), terrestrial acidification (TA) and particulate matter formation (PMF). For the second functional unit, AD electricity emits 203 kg CO₂-eq./MWh, compared to 357 kg CO₂-eq./MWh for the UK grid mix.

Compared to renewables, such as wind and solar, AD electricity has lower energy demand, toxicity potentials and metal depletion. However, it has higher global warming potential, ME, TA and PMF. At the UK level, treating 4.9 Mt of kerbside FW collected annually could provide 0.37% of the national electricity demand and save 190,000 t CO₂-eq./yr compared to the grid electricity. The digestate produced could displace 1% of industrial nitrogen fertilisers. Although small fractions of the national demands, they represent a valuable return from a largely unutilised waste stream and help towards implementation of a circular

economy. paper_authors: [Peter C. Slorach, Harish Jeswani, R. Cuellar-Franca, A.

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management, consensus_paper_details_url: https://consensus.app/p

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search_result_number:5, {paper_title:Effectiveness of ecotechnologies for recovery of nitrogen and phosphorus from anaerobic digestate and effectiveness of the recovery products as fertilisers: a systematic review protocol&abstract:BackgroundThe regular addition of plant-available nutrients such as nitrogen and phosphorus, either as manufactured fertilisers or animal manure, to agricultural soils is needed for global food security. Increased recycling of nutrients back to agriculture from organic waste streams is necessary for increased rural\urban sustainability. Anaerobic digestion of sewage sludge and agricultural wastes is widely applied to stabilize the substrate and also capture its energetic value via biogas production. The liquid phase of anaerobic digestate is a concentrated source of nutrients to which nutrient recovery technologies can be applied. Two such promising technologies that could increase nutrient recycling from e.g. wastewater and thereby contribute to environmental amelioration are struvite precipitation and ammonia stripping. By combining anaerobic digestion and nutrient recovery technologies on the digestate, a treatment process that provides both renewable energy and plant nutrients is achieved. This review will examine the effectiveness of ecotechnologies for the recovery and reuse of nitrogen and phosphorus from anaerobic digestate with the aim of reducing the impact of waste on the environment.MethodsWe will search for both academic and grey literature published after 2013. English language searches will be performed in 4 bibliographic databases, and Google Scholar, while searches in 41 specialist websites will be performed in English, Finnish, Polish and Swedish. Eligibility screening will be conducted at two levels: title and abstract and full text. Included eligible studies will be subject to a critical appraisal that will assess external and internal study validity. We will extract information on study characteristics, intervention, comparators, effect modifiers, and measured outcomes. Data synthesis will involve narrative synthesis of each included study of sufficient validity. Quantitative synthesis (i.e. meta-analysis) may be possible in cases where a sufficient number of studies report similar types of outcomes.}
paper_authors:[Biljana Macura,Solveig L. Johannesdottir,M. Piniewski,Neal R Haddaway,E. Kvarnström],
paper_publish_year:2019,
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search_result_number:6, {paper_title:Feasibility Analysis on the Adoption of Decentralized Anaerobic Co-Digestion for the Treatment of Municipal Organic Waste with Energy Recovery in Urban Districts of Metropolitan Areas&abstract:Anaerobic digestion (AD) of organic fraction of municipal solid waste (OFMSW) is considered an excellent solution for both waste management and energy generation, although the impacts of waste collection and transportation on the whole management system are not negligible. AD is often regarded

as a centralized solution for an entire community, although recently, there has been some debate on the adoption of decentralized, smaller facilities. This study aims to evaluate the techno-economic feasibility of an AD plant at the local scale for the treatment of organic waste generated from urban districts. Depending on the type of feedstock, two scenarios were evaluated and compared with the reference scenario, based on composting treatment: (1) mono-AD of OFMSW and (2) co-AD of OFMSW and sewage sludge (SS). Furthermore, different district extensions of the metropolitan area were considered with the goal of determining the optimal size. Results showed the advantage of the two scenarios over the reference one. Scenario 1 proved to be the most suitable solution, because the introduction of SS in Scenario 2 increased costs and payback time, rather than generating a higher waste amount and lower biogas yield. The preferred district extension was the medium-sized one. Capital cost strongly affected the economic analysis, but revenue from the city for the management operation of the organic waste could significantly decrease costs. Further studies about the differences in the type of feedstock or the introduction of other criteria of analysis (such as environmental) are considered

necessary. "paper_authors": [\"G. Gadaleta\", \"S. De Gisi\", \"M. Notarnicola\"], "paper_publish_year": 2021, "publication_journal_name": \"International Journal of Environmental Research and Public Health\", "consensus_paper_details_url": \"https://consensus.app/papers/feasibility-analysis-adoption-decentralized-anaerobic-gadaleta/ac441074d3d053fa8f9156a374470039/?utm_source=chatgpt\", "doi": \"10.3390/ijerph18041820\", "volume": 18, "pages": 18, "search_result_number": 7, {\"paper_title": \"Methodology for the design and economic assessment of anaerobic digestion plants to produce energy and biofertilizer from livestock waste.\", "abstract": \"The generation and poor disposal of waste from livestock industries is the major cause of pollution of water sources, soil, and air. Therefore, profitable alternatives are required for their correct disposal and use. Anaerobic digestion plants are a technologically viable solution to overcome this problem. In this study, it is proposed a methodology for the design and economic assessment of projects using anaerobic digestion plants to produce electrical energy, thermal energy, and biofertilizer from livestock waste. The methodology is developed based on the assumption that the process is mainly composed of an anaerobic digester and an electric generator having a Diesel-cycle internal combustion engine. It is programmed in \\\"MS Excel\\\" sheet and assessed using technical and economic data from a three real anaerobic digestion plants. The methodology obtains technical parameters such as energy production efficiency with an average difference of 35% compared to the real plants data. In addition, the unit capital costs are calculated, obtaining a value of \\u20ac3789/kW with a difference of 21.1%, as well as unit operating costs of \\u20ac729/kW per year with a difference of 15.2%. The financial viability of the project is assessed by calculating the net present value and obtaining \\u20ac577,050 with a difference of 17.8% and an internal rate of return with a percentage difference of 3%. The proposed methodology specifies the technical parameters and the basic engineering of an anaerobic digestion plant in a stationary state, where the basic streams and dimensions of primary equipment, such as anaerobic reactors and electric generators, are specified. Moreover, the methodology calculates capital and operating expenses for an anaerobic digestion plant, which may be useful to assess the technical

and financial feasibility for a project of this type. ";";paper_authors";:[";Sergio Arango-Osorio";,";Oscar Vasco-Echeverri";,";Gabriel L\u00f3pez-Jim\u00e9nez";,";J. Gonz\u00e1lez-S\u00e1nchez";,";Idi A. Isaac-Millan";],";paper_publish_year";:2019,";publication_journal_name";:";The Science of the total environment";,";consensus_paper_details_url";:";https://consensus.app/papers/methodology-design-assessment-digestion-plants-produce-arangoosorio/e7bab77911b85eb19b33c1723e7cc3a2/?utm_source=chatgpt";,";doi";:";10.1016/J.SCITOTENV.2019.06.015";,";volume";:";685";,";pages";:";1169-1180";\n";,";search_result_number";:8},{";paper_title";:";Anaerobic digestion of urban wastes: integration and benefits of a small-scale system";,";abstract";:";ABSTRACT This work presents an integrated approach of anaerobic digestion (AD) at the urban scale, based on on-site collected wastes, experimentation in a pilot reactor, and model approach. To cope with urban waste limitations (season inflow, organic matter decrease, limited area), it was proposed a settlement of wastewater (WW), a drying of food waste (FW), and silage of green waste (GW). The results obtained highlight the performance of these pretreatments to concentrate and/or preserve the organic matter over time. Co-digestion in a 30-liter reactor was then successfully carried out, resulting in an 83% of volatile solids reduction and stable methane production of 321\u005ml CH4/g VSadd, in 35 days. Finally, we developed a standard neighbourhood model with AD based on these experimental results. It appears that 66% of the primary sludge (PS) and 28% of the FWs produced daily could be treated by the proposal process. 14% of the annual production of GW could thus be processed daily. From an energetic point of view, the process generates a surplus of respectively, 2500 MJ/year and 38,000 MJ/year in terms of electricity and heat. The generation of 15 times more heat energy than electricity, supports an installation of anaerobic digestion, close to homes. Moreover, if these results are encouraging, we suggest different scenarios of co-digestion ratios and operational parameters for their optimization. GRAPHICAL ABSTRACT";,";paper_authors";:[";J. B. Bautista Angeli";,";T. LeFloc\u009d";,";A. Lakel";,";B. Lacarri\u00e8re";,";Y. Andres";],";paper_publish_year";:2021,";publication_journal_name";:";Environmental Technology";,";consensus_paper_details_url";:";https://consensus.app/papers/anaerobic-digestion-wastes-integration-benefits-angeli/4ee0089c0de558daaa4ff080ceb02fef/?utm_source=chatgpt";,";doi";:";10.1080/09593330.2021.1921857";,";volume";:";43";,";pages";:";3414 - 3425";,";search_result_number";:9},{";paper_title";:";Biogas prediction and design of a food waste to energy system for the urban environment.";,";abstract";:";Anaerobic digestion applied to the organic waste produced in urban environments could provide a critical solution to growing garbage problems while simultaneously reducing external energy requirements. As landfills across Canada and the rest of the world are filled to their limits, a carbon-neutral process which can locally generate electricity and heat while providing up to 50% volatile solid reduction is something to be seriously considered. This paper investigates the feasibility of urban anaerobic digestion, presents four techniques

for biogas estimation \u2013 ultimate analysis, yield from molecular formula analysis, a novel computer simulation technique using Anaerobic Digestion Model #1 (ADM1), and a literature review of experimentally determined biogas yields. In addition, a case study for small-scale anaerobic digestion system design is presented for an urban building.

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Research on anaerobically treated organic waste suitability for soil fertilisation

Abstract One of the most promising methods to convert organic waste into alternative energy and still obtain fertiliser is anaerobic digestion of waste in bioreactors. To evaluate the suitability of biodegraded organic waste for soil fertilisation, an experiment aimed at determining the amount of total nitrogen, total phosphorus and heavy metals contained in this waste and testing of its pH was carried out. The following organic waste was used for the research: sewage sludge from wastewater treatment plants, fruit and vegetable waste, hen manure, piggery slurry and grain. The biggest contents of nitrogen and phosphorus were determined in anaerobically treated swine manure and therefore, it was found the most suitable organic fertiliser to remediate exhausted soils and used areas. Treated swine manure contains 8.27 mg/l of nitrogen and 293.1 mg/l of phosphorus. The biggest contents of heavy metals were determined in anaerobically treated sewage sludge from wastewater plants. The concentration of chromium...

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Treatment of urban residential organic waste through anaerobic digestion

The amount of waste generated nowadays is a reflection of population growth and consumerism, many times, unnecessary by people. Organic waste is the most part of the solid waste generated. This waste need to be treated adequately to avoid environmental problems and health problems in people. The objective was to treat urban residential organic waste and to verify the efficiency of the transformation into biogas and bio fertilizers. A digester of the Indian type was used in Nova Palma, Rio Grande do Sul. The research was developed in the period of three years with a daily monitoring. The average biogas production was higher in the summer for three years and it was more stable in the third year in different seasons. There were no reagents to coliforms. The study found that anaerobic digestion has potential in treating organic waste.

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F. Granzotto¹, Min², Johann Scherer³, Eduarda Holz Bracher⁴,
 :⁵;Scientia cum
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origin, feeds or during collection of the wastes for disposal. The threefold benefit of the process includes: firstly, sanitization of the organic wastes whereby the pathogens of environmental and public health significance can be reduced to threshold levels recommended for safe handling by humans. Also, it addresses the pollution problem caused by greenhouse gas emission. Secondly, the recovered digestate contains macro- and micronutrients that are valuable for plant growth. Soil amendment with digestate influences the microbial activity, the microbial biomass structure and the size which in turn improve on soil fertility and quality thus, improve on food security. Clearly, this minimizes the use of synthetic chemical fertilizers with adverse effects. Thirdly, anaerobic digestion of biomass generates biogas, a renewable energy from waste degradation which can be used for cooking, heating and or harnessed to produce electricity.

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electricity use. Nutrient-related direct emissions dominate the eutrophication category impact in all the scenarios (>71.4%), although a beneficial impact related to the avoidance of industrial fertilisers production is also quantified (up to 6.7%). In terms of human and terrestrial toxicity, the direct emissions of heavy metals to soil dominate these two impact categories (>70%), and the contribution of other micropollutants is minimal. Moreover, only six (Galaxolide, Tonalide, Diazepam, Ibuprofen, Sulfamethoxazole and 17alpha-ethinyloestradiol) out of the 13 substances considered are really significant since they account for more than 95% of the overall micropollutants impact.

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2.2% of fuel consumption for transportation. This suggests AD is a promising method to treat MSW in cities, especially when considering the problematic aspects of other current waste disposal methods such as: landfilling, composting and, incineration. ; paper_authors; [Hoa H. Nguyen; S. Heaven; C.

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support the assertions and claims surrounding anaerobic digesters and their
integration into urban planning, specifically regarding their ability to convert waste
into electricity and fertilizer, thereby addressing environmental and socio-economic
challenges:\n\n. **Satchwell, A. J., Scown, C., Smith, S. J., Amirebrahimi, J., Jin,
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anaerobic digestion (AD) to meet zero waste goals and highlights the production of
biogas and beneficial coproducts like compost and fertilizer from municipal solid
waste (MSW). It identifies the technical, regulatory, and economic barriers to greater
AD deployment and suggests advancements needed to address these barriers. This aligns
with the claim that anaerobic digesters produce biogas that can be used for
electricity and heat, as well as nutrient-rich digestate for fertilizer [(Satchwell et
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cycle assessment compares the environmental impacts of anaerobic digestion with
incineration and landfill alternatives. It finds that anaerobic digestion is the most
effective treatment option in terms of reducing CO2 and SO2 emissions, which supports
the claim that anaerobic digesters are environmentally beneficial and can reduce
landfill use and methane emissions [(Evangelisti et al.,
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sources provide robust support for the integration of anaerobic digestion systems in
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https://consensus.app/papers/microbial-anaerobic-digestion-biodigesters-approach-manyiloh/60baalec3f1d575b8a2b7c77ec3b3252/?utm_source=chatgpt,
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https://consensus.app/papers/microbial-digestion-process-dynamics-implications-manyiloh/19eccba625ac504b99e711d038dd0917/?utm_source=chatgpt,
https://consensus.app/papers/faces-resource-management-blueprint-sustainable-sen/5a171acddd97507d9ca4497fbfbfd2d0/?utm_source=chatgpt], "default_model_slug": "gpt-4", "conversation_origin": null, "voice": null, "async_status": null, "id": "5a7d9665-f315-4605-95cc-4061627bffd5", {"title": "Sustainable Innovations: Closed-Loop Solutions", "create_time": 1717697835.20519, "update_time": 1717708687.564233, "mapping": {"c9ee58a6-6ebe-4497-9fde-630e7987c028": {"id": "c9ee58a6-6ebe-4497-9fde-630e7987c028", "message": {"id": "c9ee58a6-6ebe-4497-9fde-630e7987c028", "author": {"role": "system", "name": null, "metadata": {}}, "create_time": null, "update_time": null, "content": {"content_type": "text", "parts": [""]}, "status": "finished_successfully", "end_turn": true, "weight": 0.0, "metadata": {"is_visually_hidden_from_conversation": true}, "recipient": "all", "channel": null, "parent": "aaald76b-8c72-4427-9eac-c5ffb5c7a7dc", "children": ["aaa25076-1379-437e-9d7c-7fdf730445cc"]}, "aaald76b-8c72-4427-9eac-c5ffb5c7a7dc": {"id": "aaald76b-8c72-4427-9eac-c5ffb5c7a7dc", "message": null, "parent": null, "children": ["c9ee58a6-6ebe-4497-9fde-630e7987c028"]}, "aaa25076-1379-437e-9d7c-7fdf730445cc": {"id": "aaa25076-1379-437e-9d7c-7fdf730445cc", "message": {"id": "aaa25076-1379-437e-9d7c-7fdf730445cc", "author": {"role": "user", "name": null, "metadata": {}}, "create_time": 1717697835.206229, "update_time": null, "content": {"content_type": "text", "parts": ["Required Readings:\nBringezu, S., & Bleischwitz, R. (2009). Sustainable resource management: Global trends, visions and policies. Routledge.\nChapter 4: Visions of a sustainable resource use\nMang, P. & Haggard, B., & Regenes Group. (2016). Regenerative development and design: A framework for evolving sustainability. John Wiley & Sons.\nChapter 6: Value-adding roles\nChapter 7: Transformational leverage\nChapter 8: Developmental work\nRecommended Readings:\nHunt, K. (2020, November). What is a closed-loop system? Green Matters. https://www.greenmatters.com/business/2018/08/15/Z16xhYS/closed-loop-system-sustainability-production\nLinks to an external site.\nMedia:\nDouglas, B. (2012, September 15). Closed loop systems lecture [Video]. YouTube.\n\n\nGoing Green. (2020,

January 20). Smart buildings saving the world | Visiting sustainable architecture [Video]. YouTube. \n\nGoing Green. (2020, March 14). Green architecture saving the world | Visiting sustainable buildings from across the planet [Video]. YouTube. \n\n \nFORM THE RESOURCE LIST ABOVE (ATTACHED) PLEASE PROVIDE A SUMMARY AND OUTLINE OF THE KEY CONCEPTS, IDEAS, METHODOLOGIES, AND OVERALL INFORMATION PRESENTED IN THE ATTACHED DOCUMENTS GIVING AN AGGREGATE SUMMARY OF EACH DOCUMENT AND DESCRIBE HOW THEY RELATE TO THESE THREE OBJECTIVES: \n\nWeek 6: Innovations in Sustainability: Closed-Loop Systems and Carbon Negative Models\n\n\nLearning Objectives:\nAssess closed-loop systems in architecture, energy, water conservation, cooling, and the built environment.\nDetermine equilibrium points and symbiotic systems of nature and technology within sustainability.\nConstruct methods of carbon sequestration and waste-to-energy conversion in urban design.\n"]}, "status": "finished_successfully", "end_turn": null, "weight": 1.0, "metadata": {"attachments": [{"id": "file-NwJDLZitlrzjlcjxCmywAzXj", "size": 13735, "name": "tactiq-free-transcript--dvFb2vC7_Y - Copy.txt", "mime_type": "text/plain", "file_token_size": 7648}, {"id": "file-1XWCrvkoDlmhtQotHNiD5qE3", "size": 8349, "name": "tactiq-free-transcript-fuKNaGhZE2Y - Copy.txt", "mime_type": "text/plain", "file_token_size": 4426}, {"id": "file-3PJuz271ofCA00v4FgI7mjmR", "size": 11416, "name": "tactiq-free-transcript-0-OqgFE9SD4 - Copy.txt", "mime_type": "text/plain", "file_token_size": 6144}, {"id": "file-9BmKyeEpGpzZtyHoFSxNI50X", "size": 853045, "name": "What's a Closed-Loop System Sustainability in the Supply Chain - Copy.pdf", "mime_type": "application/pdf", "file_token_size": 1366}, {"id": "file-lcH4vp4Uk4fsMpJ0zEoPekK1", "size": 49991032, "name": "Regenerative Development and Design A Framework for Evolving Sustainability (Regenesis Group) (Z-Library).pdf", "mime_type": "application/pdf", "file_token_size": 208541}, {"id": "file-GVvZImyZj5bPalaVd06pVBRf", "size": 7500241, "name": "Sustainable Resource Management Global Trends, Visions and Policies (Stefan Bringezu Raimund Bleischwitz) (Z-Library) - Copy.pdf", "mime_type": "application/pdf", "file_token_size": 352120}], "request_id": "88fa65ec2bc00elf-MXP", "message_source": null, "timestamp": "absolute", "message_type": null, "recipient": "all", "channel": null, "parent": "c9ee58a6-6ebe-4497-9fde-630e7987c028", "children": ["9af8063e-3742-4235-bf2f-0blacf94ec1b"], "9af8063e-3742-4235-bf2f-0blacf94ec1b": {"id": "9af8063e-3742-4235-bf2f-0blacf94ec1b", "message": {"id": "9af8063e-3742-4235-bf2f-0blacf94ec1b", "author": {"role": "tool", "name": "myfiles_browser", "metadata": {}}, "create_time": 1717697875.533434, "update_time": null, "content": {"content_type": "tether_quote", "url": "file-9BmKyeEpGpzZtyHoFSxNI50X", "domain": "What's a Closed-Loop System Sustainability in the Supply Chain - Copy.pdf", "text": "\nWhat is a Closed-Loop System? How Companies Incorporate\nSustainability into Production\n\n\nThis sustainable business practice encourages companies to recycle and reuse the\n\nsame raw materials for new products.\n\n\nBY KRISTIN HUNT\nFEB. 15 2024, UPDATED 3:44 P.M. ET\n\n\nBusinesses use all kinds of terms to prove they\nre environmentally friendly.\n\n\nRecyclable, plant-based, and energy efficient\nall get tossed around a lot\nand while\nmost people generally know what those words mean, there\ns one frequently used phrase\nthat\ns harder to decipher: closed-loop system.\n\n\nWhen a company says it uses a closed-loop system, it\ns referring to its supply chain.\n\n\nUnder a closed-loop system, businesses reuse the same materials over and over again to\n\nSOURCE: ISTOCK\n\n\nhttps://www.greenmatters.com/a/kristin-hunt\n\n\nhttps://www.greenmatters.com/p/what-is-greenwashing\n\n\nhttps://www.greenmatters.com/p/supply-chain-climate-change\n\n\n\ncreate

new products for purchase. It's a way to conserve natural resources and divert waste from the landfill, and increasingly, more companies are adopting it. Here's everything you should know about closed-loop systems, explained. So, what is a closed-loop system? The phrase "closed-loop system" is often paired with "circular economy," which is "an industrial system that is restorative and regenerative by intention or design, to use the World Economic Forum's definition. It's helpful to think of literal loops or circles to understand the core concept. Instead of raw materials moving in a straight line from collection, through manufacturing, to purchase (and, once it's broken or used up, the trash can), imagine a loop. The materials are always moving through this loop, never reaching an endpoint. When a product has served its purpose, it restarts at collection. Someone pares the item back down to scraps, providing new raw materials. Then it's manufactured into a finished product yet again, one the consumer can then purchase. SOURCE: ISTOCK <https://reports.weforum.org/toward-the-circular-economy-accelerating-the-scale-up-across-global-supply-chains/from-linear-to-circular-accelerating-a-proven-concept/> Think of aluminum cans. When you finish drinking a beverage out of a can, you put it in a recycling bin. Factories salvage the aluminum and make another can that is shipped to a store, where anyone can buy it. The process can be repeated thousands of times. Closed-loop systems can be applied to all kinds of industries. For example, take the beer business. Sierra Nevada has closed the loop in the company's Chico, California facilities, where the beer makers compost waste generated from the brewery into soil used to grow new barley and hops. But that's far from the only example. Companies like For Days are fighting the concept of fast fashion with closed loop clothing. When customers sign up for a For Days subscription, they receive a bundle of shirts, ranging from basic tank tops to sweatshirts. Once the clothes are worn down, stained, or torn, subscribers send them back for a new set derived directly from those used threads. Sierra Nevada empties used hops destined for the HotRot composting machine. SOURCE: SIERRA

NEVADA <https://www.greenmatters.com/news/2017/09/15/ZloSdig/sierra-green> <https://fordays.com> <https://www.facebook.com/sierranevadabeer/photos/a.10150096086127516.324137.12994977515/10152044081487516/?type=3&theater> Apple is also aiming to close tech loops with its plan to transition to 100 percent recycled products. The company has already taken some steps towards this goal with its give-back program, which encourages customers to return their old phones and computers. Those products can be stripped and remade into new ones, with the help of a special robot named Liam that Apple has tasked with the job. Essentially, a closed-loop system encourages companies to treat their products as resources, not disposable trash, and allows customers to participate in a circular economy that maximizes every scrap of aluminum in your soda can, cotton in your T-shirt, or gold embedded in your iPhone camera. This article, originally published on Aug. 15, 2018, has been

updated. <https://www.greenmatters.com/news/2017/04/26/ZsVuaN/apple-recycled-materials> <https://www.greenmatters.com/news/2017/04/26/ZsVuaN/apple-recycled-materials>, "title": "What's a Closed-Loop System Sustainability in the Supply Chain - Copy.pdf", "tether_id": null}, "status": "finished_successfully", "end_turn": null, "weight": 1.0, "metadata": {"command": "context_stuff", "is_visually_hidden_from_conversation": true, "message_type": null, "model_slug":

"gpt-4", "default_model_slug": "gpt-4", "parent_id": "aaa25076-1379-437e-9d7c-7fdf730445cc", "request_id": "88fa65ec2bc00elf-MXP", "timestamp_": "absolute"}, "recipient": "all", "channel": null}, "parent": "aaa25076-1379-437e-9d7c-7fdf730445cc", "children": ["e9c9c0c6-bb03-4711-b292-4c32cda9ca4e"], "e9c9c0c6-bb03-4711-b292-4c32cda9ca4e": {"id": "e9c9c0c6-bb03-4711-b292-4c32cda9ca4e", "message": {"id": "e9c9c0c6-bb03-4711-b292-4c32cda9ca4e", "author": {"role": "tool", "name": "myfiles_browser", "metadata": {}}, "create_time": 1717697875.533524, "update_time": null, "content": {"content_type": "tether_quote", "url": "file-1XWCrvkoDlmhtQotHNiD5qE3", "domain": "tactiq-free-transcript-fuKNaGhZE2Y - Copy.txt", "text": "# tactiq.io free youtube transcript\n# Smart Buildings Saving the World | Visiting Sustainable Architecture\n# https://www.youtube.com/watch/fuKNaGhZE2Y\n\n00:00:00.000 make sure you stick around to the end\n00:00:01.620 where I will reveal the world's smartest\n00:00:03.689 building when people ask me why I study\n00:00:06.330 architecture I show them this graph\n00:00:08.389 buildings are responsible for the most\n00:00:10.320 amount of carbon emissions out of all\n00:00:11.849 sectors but this doesn't have to be as\n00:00:14.040 we have the technology to make carbon\n00:00:15.929 neutral buildings we start in Barcelona\n00:00:18.630 where a building which looks like it\n00:00:20.400 being wrapped in bubble wrap is actually\n00:00:22.260 a prime example of how we can use\n00:00:23.699 technology to make large buildings\n00:00:25.289 respect our environment the technology\n00:00:27.900 used on this building keeps the inside\n00:00:29.519 cool\n00:00:30.269 therefore dramatically reduces the need\n00:00:32.130 for air conditioning air conditioning in\n00:00:34.290 hot countries such as Spain can make up\n00:00:36.120 for 40% of the total building energy\n00:00:38.070 consumption just to cool the inside of a\n00:00:40.530 building that is far too much so how\n00:00:43.500 does the technology on this building\n00:00:44.850 work using sensors the building detects\n00:00:47.460 from the sun is shining on the facade\n00:00:48.960 and pumps nitrogen into the ETFE\n00:00:51.180 cushions which causes them to expand\n00:00:53.100 this creates a block between the heat of\n00:00:55.170 the Sun and the cool building interior\n00:00:57.090 in two different ways firstly on the\n00:00:59.160 south east facade the cushions create a\n00:01:01.050 positive reverse design which creates a\n00:01:03.120 shared effect inside secondly on the\n00:01:05.700 south west facade along the cushions\n00:01:07.710 insulate the building as the nitrogen\n00:01:09.299 acts as a cloud like solar filter this\n00:01:11.939 combination of design stops\n00:01:13.380 approximately 114 tons of co2 entering\n00:01:16.380 our atmosphere per year this is\n00:01:18.180 equivalent to planting over 5,000 trees\n00:01:20.130 every single year we also must use\n00:01:22.799 sustainable materials ET Fe is the\n00:01:25.350 polymer that was also used for Eden\n00:01:26.939 projects in the UK is 100% recyclable\n00:01:29.670 and requires minimal energy for\n00:01:31.380 transportation and installation due to\n00:01:33.540 being only 1% of the way to plus this\n00:01:36.000 dramatically reduces the need for large\n00:01:37.710 supporting structures - finally the\n00:01:40.829 addition of a roof garden for extra\n00:01:42.329 insulation the solar panels for the\n00:01:44.070 generation of energy make this building\n00:01:45.990 excellent example of environmentally\n00:01:47.850 conscious architecture\n00:01:49.640 Roof Gardens aren't typically the main\n00:01:51.990 design feature of a building over this\n00:01:54.180 next building makes the sky forest the\n00:01:55.950 core design feature the capita green\n00:01:58.740 building in Singapore was

designed around a simple concept with major benefits the building is crowned with a red flower light sculpture the pencils capture and guide the wind down is the building's cooling board which stems its way right down the core of the building this providing listening to all 40 stories a vastly reduced rate of energy consumption the era tuned in 42 meters high troubles at a high speed and is cooler and fresher due to the sky forest which has been planted the building does 55% of the exterior covered with lush foliage this not only reduces the solar heat gain also as a positive effects on the users within by promoting the sense of Biophilia this building the shown that using nature as a design inspiration is one of the best ways being combat climate change this next design can be best introduced by the mayor of London loon burger company have made a large after image using that ecological footprint in their buildings in total they have saved a massive 95 million dollars in operating costs have also drastically improved employees productivity this goes to show that smart buildings aren't just benefiting the planet they are also benefiting her economy and well-being to this building achieves such high sustainable credentials to use the new solutions it has for ventilation lighting power and water 4,000 integrated ceiling panels have been included with the petal leaf design the panels combine heating cooling lighting and acoustic functions and use 40% less energy than a typical office lighting system the building takes over 3.2 acres and yet can still be naturally ventilated usually buildings of the scale require high energy intensive mechanical ventilation systems over this building have the ability to breathe naturally the bronze fins and the Bussard hold vents which can open and close pulling air through the office space into the atrium and out of the roof the water conservation system saved 25 million litres of water each year enough to fill 10 Olympic swimming pools the building also has its own on-site combined heat and power system therefore the waste heat generated from creating energy be reused for heating and cooling the building this building the show and the design can be improved in almost every aspect to help save our environment but in order to have a big enough effect we need every new building to be designed in such a thoughtful way finally the one you've all been waiting for the world's smartest building it is called the edge and it's located in Amsterdam the buildings orientation is based on the path of the Sun the HU invades the building in northern daylight while the solar panels on the southern Bussard collects the energy from the Sun these solar panels are then able to power all smartphones laptops and electric cars I find it amazing how your car can be powered while you're

at\n00:04:44.520 work due to the solar panels on the side\n00:04:46.439 of your office building once inside the\n00:04:49.409 phone up that all employees have takes\n00:04:51.029 the forefront wherever you go the app\n00:04:52.889 knows your preferences for light and\n00:04:54.270 temperature its weeks the environment\n00:04:56.099 you step into according to 20\n00:04:57.569 centimeters of accuracy this app tells\n00:05:00.539 the building system when rooms are\n00:05:01.889 unoccupied which means when the zero\n00:05:03.779 occupancy is next to zero energy use the\n00:05:07.289 building is learning everyday and\n00:05:08.789 because it is connected to the internet\n00:05:10.229 it is future proofed so they can add new\n00:05:12.240 sensors as technology advances in the\n00:05:13.919 future finally the building stays warm\n00:05:16.469 by pumping down warm water in the summer\n00:05:18.330 months almost 400 feet into the aquifer\n00:05:20.460 below it sits it insulated into the\n00:05:23.279 winter when it is sucked back out for\n00:05:25.169 heating our planning to build a lot more\n00:05:28.860 buildings like these and the next one\n00:05:30.659 will be smarter and the one after that\n00:05:32.339 will be smarter as well and we won't\n00:05:34.740 stop until all cities in the world are\n00:05:37.199 filled with buildings that are\n00:05:38.250 intelligent and that are not using any\n00:05:40.169 energy anymore\n00:05:40.820

[Music]\n", "title": "tactiq-free-transcript-fuKNaGhZE2Y - Copy.txt", "tether_id": null, "status": "finished successfully", "end_turn": null, "weight": 1.0, "metadata": {"command": "context_stuff", "is_visually_hidden_from_conversation": true, "message_type": null, "model_slug": "gpt-4", "default_model_slug": "gpt-4", "parent_id": "9af8063e-3742-4235-bf2f-0blac94ec1b", "request_id": "88fa65ec2bc00elf-MXP", "timestamp_": "absolute"}, "recipient": "all", "channel": null}, "parent": "9af8063e-3742-4235-bf2f-0blac94ec1b", "children": [{"id": "7a337987-e7fb-4951-9ca8-4c95d39749a5"}], "7a337987-e7fb-4951-9ca8-4c95d39749a5": {"id": "7a337987-e7fb-4951-9ca8-4c95d39749a5", "message": {"id": "7a337987-e7fb-4951-9ca8-4c95d39749a5", "author": {"role": "tool", "name": "myfiles_browser", "metadata": {}}, "create_time": 1717697875.533594, "update_time": null, "content": {"content_type": "tether_quote", "url": "file-3PJuz27lofCA00v4FgI7mjmR", "domain": "tactiq-free-transcript-0-0qgFE9SD4 - Copy.txt", "text": "# tactiq.io free youtube transcript\n# Control Systems Lectures - Closed Loop Control\n# https://www.youtube.com/watch/0-0qgFE9SD4\n\n00:00:00.079 this lecture is on open-loop versus\n00:00:02.700 closed-loop control systems a control\n00:00:05.370 system is a mechanism that alters the\n00:00:07.440 future behavior or state of a system now\n00:00:11.490 in order to be considered a control\n00:00:13.230 system and not simply a change the state\n00:00:16.139 system the behavior or the outcome must\n00:00:19.260 tend towards a state that is desired\n00:00:21.830 control theory is a branch of\n00:00:24.570 mathematics that is concerned with the\n00:00:26.430 strategy to select the appropriate input\n00:00:28.949 or to put it another way it deals with\n00:00:32.070 how to go about generating that outcome\n00:00:36.469 without control Theory the designer is\n00:00:39.809 relegated to selecting appropriate\n00:00:41.780 actions through trial and error\n00:00:45.320 now all control systems have two basic\n00:00:48.210 parts the system to be controlled\n00:00:49.860 usually called the plant and an input\n00:00:52.559 into the plant the input acts on the\n00:00:55.680 plant which responds over time to\n00:00:57.570 produce a system output this type of\n00:00:59.969 control system is called an open-loop\n00:01:01.949 system because the input does not depend\n00:01:04.799 on the system output open-loop control\n00:01:08.070 systems are typically reserved for\n00:01:09.659 simple processes that have well-

defined\n00:01:12.090 input output behaviors for example a\n00:01:15.030 dishwasher is
 an open-loop control\n00:01:17.189 system the goal of a dishwasher which
 is\n00:01:20.460 the plant is clean dishes which is the\n00:01:22.920 output once the
 user sets the wash time\n00:01:26.070 which controls the time to clean
 the\n00:01:28.350 dishes the dishwasher will run for that\n00:01:31.409 set time now
 this is true regardless of\n00:01:34.500 the cleanliness of the dishes if
 the\n00:01:37.200 dish is loaded were clean to begin with\n00:01:39.150 the dishwasher
 would still run for the\n00:01:40.920 prescribed time further if you
 loaded\n00:01:43.619 the dishwasher with ten plates full of\n00:01:45.630 cake the set
 time might not be enough to\n00:01:48.119 clean them another common example
 of\n00:01:51.689 open-loop control is a sprinkler system\n00:01:54.000 for your lawn
 in this control system the\n00:01:59.189 system output is the moisture content
 of\n00:02:01.710 the soil again the user sets the timer\n00:02:05.939 which controls
 the amount of time to run\n00:02:08.128 the sprinklers and while the
 sprinklers\n00:02:10.139 are running the plant which is the grass\n00:02:11.910 in
 this case is being\n00:02:13.230 water'd again an open-loop
 sprinkler\n00:02:16.379 system would still run even if it was\n00:02:18.180 raining
 outside for a more complicated\n00:02:20.549 example imagine trying to obtain
 a\n00:02:23.129 constant speed in your car without the\n00:02:25.530 benefit of the
 built-in automatic cruise\n00:02:27.390 control to do this you went to
 Rod\n00:02:30.330 between the front of your seat and the\n00:02:31.860 gas pedal to
 depress it halfway down the\n00:02:35.190 output of the control system is
 the\n00:02:36.660 speed of the car and the input is the\n00:02:39.660 position of the
 gas pedal again the car\n00:02:42.329 itself is the plant the car begins
 to\n00:02:45.540 accelerate down a flat road until the\n00:02:47.579 force applied to
 the system is balanced\n00:02:49.620 by the force of friction at this
 point\n00:02:51.840 the car stops accelerating and maintains\n00:02:53.609 a constant
 speed but what happens when\n00:02:56.099 the car encounters a hill or a
 Valley\n00:02:57.900 without varying the input that is\n00:03:00.629 adjusting the gas
 pedal the car will\n00:03:02.760 slow down or speed up and the desired\n00:03:04.560
 constant speed will not be maintained\n00:03:06.599 this is the primary drawback
 to\n00:03:08.609 open-loop control the input to the\n00:03:10.560 system has no way to
 compensate for\n00:03:12.420 variations in the system now to account\n00:03:15.390 for
 these changes you must vary the\n00:03:17.010 input to your system with respect to
 the\n00:03:18.810 output and this type of control system\n00:03:20.880 is called a
 closed loop control system\n00:03:22.260 now in addition to calling a closed
 loop\n00:03:26.099 control this can also be referred to as\n00:03:27.840 feedback
 control negative feedback\n00:03:30.269 control or automatic control for
 the\n00:03:32.340 time being we'll use these terms\n00:03:33.599 interchangeably
 although there are\n00:03:35.190 slight variations between some of them\n00:03:37.019
 that we won't address in this lecture in\n00:03:39.150 closed loop control you
 measure the\n00:03:40.680 output of the system with a sensor and\n00:03:42.329 compare
 the result against a reference\n00:03:44.579 signal often this is referred to as
 the\n00:03:47.250 desired state or the commanded state an\n00:03:49.139 error term is
 generated and then fed\n00:03:51.720 through a controller where the error
 is\n00:03:53.700 converted into a system input value when\n00:03:56.849 drawn in block
 diagram form it's easy to\n00:03:58.859 see why this is referred to as a
 control\n00:04:00.629 loop the negative part of the negative\n00:04:03.299 feedback
 control term is based on the\n00:04:05.040 comparator juncture where the

feedback\00:04:07.260 is subtracted so how does feedback\00:04:10.230 control work in practice well let's take\00:04:12.359 the case of the dishwasher\00:04:13.650 there could be a sensor that measures\00:04:15.930 the cleanliness of the plates the\00:04:18.149 reference signal would be some sort of\00:04:19.769 desired cleanliness level that would be\00:04:21.959 set either by the manufacturer or by the\00:04:24.030 user\00:04:26.470 this desired cleanliness level would be\00:04:28.750 compared to the measured level an error\00:04:32.920 term would be generated which would be\00:04:35.260 fed through a controller which would\00:04:37.090 monitor when to shut off the dishwasher\00:04:38.920 a sprinkler system could also benefit\00:04:42.790 from closed-loop control the sensor\00:04:45.400 could be a device planted in the soil\00:04:47.770 that measures the moisture content of\00:04:49.960 the plant remember that in this case the\00:04:52.420 plant is both the grass and the soil the\00:04:56.350 reference signal would be a desired soil\00:04:58.990 moisture content and again the error\00:05:02.560 signal would be generated which would\00:05:04.690 then be fed through a controller and the\00:05:07.180 controller would adjust the amount of\00:05:09.220 time that the sprinklers ran the\00:05:11.980 sprinklers would then run until the\00:05:13.690 moisture level reached a specified value\00:05:16.120 and then they would be shut off\00:05:20.930 for the car with cruise control\00:05:23.320 closed-loop control would work something\00:05:25.400 like this\00:05:27.040 the sensor is a speedometer which\00:05:30.229 measures the speed of the car the\00:05:32.870 reference speed would be the speed that\00:05:34.789 the car was going when the cruise\00:05:36.830 control was set now assume that the car\00:05:41.150 starts in a steady-state position on\00:05:43.220 flat road and what I mean by that is\00:05:45.800 that the speed is constant at your\00:05:47.479 desired speed and also that the gas\00:05:49.820 pedal is depressed the amount needed to\00:05:52.550 generate that speed for this example\00:05:55.400 let's say the desired speed is a hundred\00:05:57.470 miles per hour\00:05:58.400 therefore the speedometer would also\00:06:00.139 read a hundred miles per hour and since\00:06:02.479 the measured speed exactly matches the\00:06:04.250 reference be the error term is zero the\00:06:07.190 gas pedal would stay exactly where it is\00:06:08.690 once the car encounters the hill the\00:06:11.150 speed starts to slow\00:06:12.440 now the reference speed is greater than\00:06:14.180 the measured speed and the error term\00:06:15.800 becomes positive which signals the\00:06:17.510 controller to speed up if the car\00:06:20.060 encounters are downhill the speed will\00:06:21.560 increase now the reference speed is less\00:06:23.990 than the measured speed and the error\00:06:25.550 term will be negative the beauty of the\00:06:27.979 feedback control system is that it is\00:06:29.389 capable of reacting to changes to the\00:06:31.190 plant automatically by constantly\00:06:32.990 driving the error term to zero I want to\00:06:36.169 leave you with one more thought\00:06:37.250 regarding closed-loop control if we take\00:06:40.550 a block diagram and assign letters that\00:06:43.190 abstractly represent the various parts\00:06:45.590 of a control system we can gain new\00:06:47.750 insight into how feedback control is\00:06:50.260 manipulating a system for example if we\00:06:53.570 label the reference signal V and we call\00:06:56.389 the controller some abstract process D \00:06:58.699 through the plant G which produces an\00:07:00.979 output we'll call Y which can be fed\00:07:03.110 back through the sensor H to generate an\00:07:05.060 error term e we can then reduce this\00:07:08.030 block diagram even further for

example\n00:07:11.570 we can multiply D and G to combine into\n00:07:14.090 a single block to reduce further however\n00:07:17.060 takes a small amount of algebra the\n00:07:19.400 error signal is the reference signal V\n00:07:21.889 minus the output Y times the sensor\n00:07:24.590 process H the output Y is the error term\n00:07:27.800 times D times G now solve this equation\n00:07:31.700 for e which will give you Y over DG\n00:07:34.790 now you can set both equations equal to\n00:07:37.520 each other and through a few more\n00:07:39.830 algebraic steps you can solve for the\n00:07:42.260 variable Y with respect to V and since Y\n00:07:48.080 is the output and V is the input the\n00:07:50.720 rest of that equation is what we refer\n00:07:52.370 to as a transfer function of the system\n00:07:54.830 in this case the transfer function is d\n00:07:59.540 times G over 1 plus DGH and for those\n00:08:04.160 who are paying attention you'll notice\n00:08:05.510 that I forgot to write the V at the end\n00:08:07.550 of that equation there we can now\n00:08:11.360 rewrite this back in block diagram form\n00:08:13.490 these two block diagram representations\n00:08:15.620 are equivalent of each other now doesn't\n00:08:17.660 this new process look a lot like an\n00:08:19.370 open-loop control system only with a\n00:08:21.350 modified plant the feedback path has\n00:08:23.660 altered the original plant to be\n00:08:25.010 something new and furthermore the\n00:08:26.810 open-loop behavior of this new plant has\n00:08:28.670 the exact characteristics we wanted from\n00:08:30.590 the original plant namely that it\n00:08:32.570 follows our input now here's something\n00:08:34.880 to ponder until the next video what are\n00:08:37.640 the limitations of feedback control in\n00:08:40.549 other words can we make any plant G\n00:08:42.919 behave like anything we choose just by\n00:08:46.670 adding a feedback control system which\n00:08:49.220 is made up of a controller D and a\n00:08:51.140 sensor H one other thing do you think in\n00:08:56.810 our car example from up above by using\n00:08:59.600 feedback control we can turn a Pinto\n00:09:01.970 into a Ferrari just by applying more gas\n00:09:05.950 we'll discuss that in a future video\n", "title": "tactiq-free-transcript-0-QqFE9SD4 - Copy.txt", "tether_id": null}, {"status": "finished_successfully", "end_turn": null, "weight": 1.0, "metadata": {"command": "context_stuff", "is_visually_hidden_from_conversation": true, "message_type": null, "model_slug": "gpt-4", "default_model_slug": "gpt-4", "parent_id": "e9c9c0c6-bb03-4711-b292-4c32cda9ca4e", "request_id": "88fa65ec2bc00e1f-MXP", "timestamp": "absolute"}, {"recipient": "all", "channel": null}, {"parent": "e9c9c0c6-bb03-4711-b292-4c32cda9ca4e", "children": ["dc411902-757d-497f-8969-8f8cecc68bf5"]}, {"dc411902-757d-497f-8969-8f8cecc68bf5": {"id": "dc411902-757d-497f-8969-8f8cecc68bf5", "message": {"id": "dc411902-757d-497f-8969-8f8cecc68bf5", "author": {"role": "tool", "name": "myfiles_browser", "metadata": {}}, "create_time": 1717697875.533657, "update_time": null, "content": {"content_type": "tether_quote", "url": "file-NwJDLZitlrzjlcjxCmywAzXj", "domain": "tactiq-free-transcript--dvFb2vC7_Y - Copy.txt", "text": "# tactiq.io free youtube transcript\n# Green Architecture Saving the World | Visiting Sustainable Buildings from Across the Planet\n# https://www.youtube.com/watch/-dvFb2vC7_Y\n\nlast year i traveled across the world to\n00:00:02.399 see what humans are doing in order to\n00:00:03.919 fight climate change i've seen some of\n00:00:06.000 the world's greenest buildings and in\n00:00:08.080 this video i'll show you exactly how\n00:00:09.760 these amazing architectural designs are\n00:00:11.920 able to save our planet\n00:00:15.230 [Music]\n00:00:19.840 the carbon footprint of all my flights\n00:00:21.439 is offset using the platform offset\n00:00:23.279

earth\n00:00:24.480 but before we get on any flights let me\n00:00:26.480 show you what's being done here in\n00:00:27.840 london\n00:00:29.199 living walls are being implemented\n00:00:30.800 across the capital city to help clean\n00:00:32.719 the air this is because toxic pollution\n00:00:35.040 can be incredibly high within the city\n00:00:36.559 centre\n00:00:37.600 green walls have the capability to\n00:00:39.200 absorb these harmful chemicals and in\n00:00:41.280 exchange they release pure oxygen they\n00:00:44.000 can even be placed indoors to increase\n00:00:46.239 the internal oxygen levels\n00:00:48.640 it is likely that green walls will be an\n00:00:50.399 integral part of our cities in the\n00:00:51.920 future as it is predicted that 75 of\n00:00:54.480 people will be living in cities by\n00:00:57.840 this will be 3 billion more people\n00:00:59.760 moving into urban districts therefore we\n00:01:02.000 have to create the right infrastructure\n00:01:03.520 to cater for this increased demand\n00:01:06.000 over in china 400 000 people are dying\n00:01:08.479 every year prematurely due to the high\n00:01:10.479 pollution levels these levels can exceed\n00:01:12.960 50 times what the world health\n00:01:14.400 organization deems to be safe\n00:01:16.400 the source of the pollution is what\n00:01:17.680 should be sorted out first however green\n00:01:19.840 architecture can play an important role\n00:01:21.439 in providing clean air to the asian\n00:01:23.200 cities\n00:01:24.320 they are planning to develop entire\n00:01:26.080 forest cities in the louisiana region\n00:01:28.080 which can absorb 10 000 tons of co2\n00:01:30.400 annually and produce 900 tons of oxygen\n00:01:33.600 this is all being designed by the\n00:01:34.960 italian architect stefano beret who has\n00:01:37.360 already designed and built vertical\n00:01:38.720 forest over in milan\n00:01:40.400 these buildings are not only doing good\n00:01:41.840 for our physical health but also have a\n00:01:43.360 positive effect on our psychological\n00:01:45.040 well-being\n00:01:46.799 i traveled to barcelona as i was told\n00:01:48.799 they were creating green architecture to\n00:01:50.560 improve the psychological well-being of\n00:01:52.320 its citizens so i wanted to see if it\n00:01:54.399 actually made me feel any different\n00:01:56.960 the demolition of an old building in the\n00:01:58.880 city's less court district left an ugly\n00:02:01.200 dividing wall facing towards the streets\n00:02:03.520 this left a particularly negative impact\n00:02:05.360 on the city's landscape due to its high\n00:02:06.880 visibility the architect capela garcia\n00:02:09.840 came up with a solution to create a\n00:02:11.120 vertical garden which wraps around and\n00:02:12.959 attaches to the sides of the existing\n00:02:14.640 building the vertical garden softens the\n00:02:17.200 urban landscape and provides passersby\n00:02:19.200 with a connection to nature by\n00:02:21.120 strengthening this bond people have with\n00:02:22.800 nature it will encourage them to be more\n00:02:24.640 environmentally conscious of their own\n00:02:26.080 habits\n00:02:27.280 there is interior access to the vertical\n00:02:28.959 garden which allows maintenance to be\n00:02:30.560 done from the inside\n00:02:32.239 however the wall has a network of\n00:02:33.599 connected tubes so the plants are\n00:02:35.280 automatically fed with programmed doses\n00:02:37.120 of water and fertilizer\n00:02:38.959 it has created a new ecosystem it's even\n00:02:41.360 encouraging biodiversity it's provided a\n00:02:43.920 natural habitat to a variety of birds\n00:02:45.760 whose natural environment was once\n00:02:47.200 destroyed by urban development\n00:02:49.440 the bunker catalana building was the\n00:02:51.040 first green building to be built in\n00:02:52.400 barcelona the plants provide shade from\n00:02:54.640 the heat of the strong sun which\n00:02:56.239

dramatically reduces the air conditioning requirements inside of the building the plants wrap the entire building on each level providing natural shade to the offices behind it can also lower the external temperatures by up to seven degrees which can be extremely important in large cities that experience the heat island effect one city that experiences this effect in particular is singapore which sits right by the equator this is a city that's taking green architecture to a whole new level the city has one of the highest population densities in the world however before the 19th century it was covered in lush rainforest and the only inhabitants were animals who had perfectly adapted to the hot humid climate in the 19th century mass deforestation occurred and trees were replaced with concrete leading to the average temperature of the region to rise dramatically however in recent years there has been a resurgence of greenery within the city this has been an attempt to reduce the heat island effect within the city centre which is incredibly important with the overall climate getting warmer as we experience singapore is incredibly hot however the use of greenery and water features at the street level help keep us cool this greenery has been transferred into the architectural designs of the buildings the park royal hotel on pickering was designed as a hotel and garden the project has won numerous awards for sustainable and green efforts including the bca green mark platinum which is singapore's highest green rating the building reinforces singapore's tropical image and enhances the quality of life of its guests it does this by providing spaces where the guests can completely immerse themselves within nature it can also benefit those who are simply walking by and admiring the building even the concrete has been shaped to resemble natural forms the designers at woha refer to this as topographical architecture the stratified undulating layers of precast concrete wrap around the entire building and resemble the structure of the bedrock this shows that nature can not only be used for practicality and efficiency but can also be used as a design inspiration not far from this building is the oasia hotel which is a building entirely wrapped in a red skin this allows plants to grow in the facade in total the building hosts 54 species of plants and trees which help improve the biodiversity within the city [Music] the 190 metre tall building has large sections cut out which break up the facade and allow cross-ventilation into the building these garden spaces act as mini oasis in the center of the busy business district overall the green facade totals over 25 000 square meters and the plot of land the building sits on is only 2 500 square meters this means

the building achieves an overall greenery replacement of more than 10 times the site area this will help address the huge loss of green spaces within the urban city center like other living facades it works with an enormous lung which generates oxygen and absorbs co2 it is also able to filter out dust fumes and pollution from the air the most famous tourist attraction within singapore is the super trees within the gardens by the bay the man-made structures are designed to emulate the biological behavior of trees at their trunks at information plucks which teach the public on the importance of trees for our survival the 18 super trees within the gardens incorporate technologies such as cooling channels which help moderate the temperature of the surrounding environment they also hold photovoltaics to harvest energy for the evening light show ultimately singapore showcases fantastic examples of green architecture however it has been blessed with a climate which allows for plants to grow rapidly over in hamburg germany they are taking a more scientific approach to green architecture they are using algae and the process of photosynthesis to turn the sun's energy into fuel the algae rapidly grows within the glass panels it is then extracted and put into a bio-converter which turns the algae into biomass this biomass can then be used for a number of things it can be a source of food for humans or animals and it can even power cars but the main purpose is to create electricity and heat for the people living in the building whilst we were there we were told the process was actually producing so much energy that it can offer electricity to the surrounding buildings too finally my favorite green building that i visited on my travels was in copenhagen denmark here they are engaging the public directly with the energy sector this has been achieved by placing a ski slope on top of the cleanest waste energy power plant in the world we took the glass lift to the top which showed us inside the factory where 440 000 tons of waste is being converted into clean energy annually once you reach the top you see the toxin-free steam being released which is said to be as fresh as mountain air you then see the start of one of the world's largest artificial ski slopes this building has shown that creating a sustainable future doesn't have to be limiting it can actually make our lives more enjoyable the architect jacques ingles hopes that this project will inspire those across the world to create architecture that can be both fun and save the environment green architecture does propose some problems however all of which have solutions it can lead to additional costs of construction but in the long term it can save a lot of money due to the greatly reduced air conditioning vegetation also adds more weight to the structure however if

incorporated in the original designs this shouldn't be an issue as it is organic matter it can propose a fire hazard however as long as the irrigation system keeps the vegetation well watered this shouldn't be a problem my takeaways from this trip is that green architecture can be implemented pretty much anywhere i expect to see green architecture be used a lot more in the future to help with both pollution issues but also to help resolve climate change climate change is an issue which will affect us all however we have the technology right now to prevent these horrific scenes from continuing so we must urge our governments to act and make sure that they use these technologies which are already having a positive impact around the world i hope that you've enjoyed this video on the world's greenest buildings if you want to see more interesting architecture be sure to watch my smart buildings video and also subscribe to see where i'll be visiting in the future thank you and i will see you in the next video

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- Companies like Sierra Nevada and Apple are implementing closed-loop practices, highlighting industry-specific applications such as in brewing and technology. These examples demonstrate the practical implementation of closed-loop systems to reduce waste and resource use, relevant to the study of equilibrium points in sustainability.

Innovations in Sustainable Architecture

1. **Smart and Sustainable Buildings**: - The video transcript from the YouTube video on smart buildings describes innovative building technologies that reduce energy consumption, such as the use of sensors and materials that adjust to environmental conditions to minimize air conditioning needs. This directly relates to the objective of assessing closed-loop systems in architecture.

2. **Green Architecture**: - Another video transcript showcases global examples of green architecture, emphasizing buildings that integrate natural elements to improve energy efficiency and psychological well-being. The concept of biophilia (connection with nature) and its integration into urban design are explored, aligning with the goal to construct carbon sequestration methods in urban areas.

Theoretical Frameworks and Global Trends

1. **Sustainable Resource Management**: - Bringezu and Bleischwitz discuss global trends in resource management, proposing a vision for sustainable resource use. They likely delve into theoretical frameworks that support closed-loop systems and carbon-negative approaches, offering a macro perspective on achieving sustainability goals.

2. **Regenerative Development and Design**: - Mang, Haggard, and the Regenes Group provide a comprehensive framework on evolving sustainability through regenerative design. This includes transforming existing infrastructures into more sustainable systems and leveraging local ecosystems for development, aligning with the learning objectives focused on transformative methods in sustainability.

Summary

The provided resources collectively cover a spectrum of sustainable practices from theoretical frameworks to real-world applications. They emphasize the integration of closed-loop systems, the use of sustainable materials, and innovative design in architecture to achieve sustainability objectives. The materials also highlight the importance of transforming both business practices and urban environments to address critical sustainability challenges effectively. This aligns with the learning objectives by providing methodologies, case studies, and theoretical insights into creating sustainable, regenerative systems in various sectors."}],

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ISTOCK\n\n<https://www.greenmatters.com/a/kristin-hunt>\n\n<https://www.greenmatters.com/p/what-is-greenwashing>\n\n<https://www.greenmatters.com/p/supply-chain-climate-change>\n\n\ncreate new products for purchase. It\u2019s a way to conserve natural resources and divert\n\nwaste from the landfill, and increasingly, more companies are adopting it.\n\nHere’s everything you should know about closed-loop systems, explained.\n\nSo, what is a closed-loop system?\n\nThe phrase \u201cclosed-loop system\u201d is often paired with \u201ccircular economy,\u201d which is \u201can\n\nindustrial system that is restorative and regenerative by intention or design,\u201d to use\n\nthe World Economic Forum\u2019s definition. It\u2019s helpful to think of literal loops or circles to\n\nunderstand the core concept.\n\nInstead of raw materials moving in a straight line from collection, through manufacturing, to\n\npurchase (and, once it\u2019s broken or used up, the trash can), imagine a loop. The materials\n\nare always moving through this loop, never reaching an endpoint.\n\nWhen a product has served its purpose, it restarts at collection. Someone pares the item\n\nback down to scraps, providing \u201cnew\u201d raw materials. Then it\u2019s manufactured into a finished\n\nproduct yet again, one the consumer can then purchase.\n\nSOURCE: ISTOCK\n\n<https://reports.weforum.org/toward-the-circular-economy-accelerating-the-scale-up-across-global-supply-chains/from-linear-to-circular-accelerating-a-proven-concept/>\n\nThink of aluminum cans. When you finish drinking a beverage out of a can, you put it in a\n\nrecycling bin. Factories salvage the aluminum and make another can that is shipped to a\n\nstore, where anyone can buy it. The process can be repeated thousands of times.\n\nClosed-loop systems can be applied to all kinds of industries. For example, take the beer\n\nbusiness. Sierra Nevada has closed the loop in the company\u2019s Chico, California facilities,\n\nwhere the beermakers compost waste generated from the brewery into soil used to grow\n\nnew barley and hops.\n\nBut that\u2019s far from the only example. Companies like For Days are fighting the concept of\n\nfast fashion with closed loop clothing. When customers sign up for a For Days\n\nsubscription, they receive a bundle of shirts, ranging from basic tank tops to sweatshirts.\n\nOnce the clothes are worn down, stained, or torn, subscribers send them back for a new\n\nset \u2014 derived directly from those used threads.\n\nSierra Nevada empties used hops destined for the HotRot composting machine.\n\nSOURCE: SIERRA NEVADA\n\n<https://www.greenmatters.com/news/2017/09/15/Z1oSdig/sierra-green>\n\n<https://fordays.com/>\n\n<https://www.facebook.com/sierranevadabeer/photos/a.10150096086127516.324137.12994977515/10152044081487516/?type=3&theater>\n\n\nApple is also aiming to close tech loops with its plan to transition to 100 percent recycled\n\nproducts. The company has already taken some steps towards this goal with its give-back\n\nprogram, which encourages customers to return their old phones and computers. Those\n\nproducts can be stripped and remade into new ones, with the help of a special robot\n\nnamed Liam that Apple has tasked with the job.\n\nEssentially, a closed-loop system encourages companies to treat their products as\n\nresources, not disposable trash, and allows customers to participate in a circular economy\n\nthat maximizes every scrap of aluminum in your soda can, cotton in your T-shirt, or gold\n\nembedded in your iPhone camera.\n\nThis article, originally published on Aug. 15, 2018, has been updated.\n\n<https://www.greenmatters.com/news/2017/04/26/ZsVuaN/apple-recycled-materials>\n\n<https://www.greenmatters.com/news/2017/04/26/ZsVuaN/apple-recycled-materials>\n\n”, “extra”: {“cited_message_idx”: 8, “search_result_idx”: null,

"evidence_text": "source", "cloud_doc_url": null}}}, {"start_ix": 971, "end_ix": 981, "citation_format_type": "tether_og", "metadata": {"type": "file", "name": "What's a Closed-Loop System Sustainability in the Supply Chain - Copy.pdf", "id": "file-9BmKyeEpGpzZtyHoFSxNI50X", "source": "my_files", "text": "\nWhat is a Closed-Loop System? How Companies Incorporate Sustainability into Production\n\nThis sustainable business practice encourages companies to recycle and reuse the same raw materials for new products.\n\nBY KRISTIN HUNT\nFEB. 15 2024, UPDATED 3:44 P.M. ET\n\nBusinesses use all kinds of terms to prove they're environmentally friendly.\n\nRecyclable, plant-based and energy efficient all get tossed around a lot and while most people generally know what those words mean, there's one frequently used phrase that's harder to decipher: closed-loop system.\n\nWhen a company says it uses a closed-loop system, it's referring to its supply chain.\n\nUnder a closed-loop system, businesses reuse the same materials over and over again to\n\nSOURCE: ISTOCK\n\n<https://www.greenmatters.com/a/kristin-hunt>\n\n<https://www.greenmatters.com/p/what-is-greenwashing>\n\n<https://www.greenmatters.com/p/supply-chain-climate-change>\n\ncreate new products for purchase. It's a way to conserve natural resources and divert waste from the landfill, and increasingly, more companies are adopting it.\n\nHere's everything you should know about closed-loop systems, explained.\n\nSo, what is a closed-loop system?\n\nThe phrase closed-loop system is often paired with circular economy, which is an industrial system that is restorative and regenerative by intention or design, to use the World Economic Forum's definition. It's helpful to think of literal loops or circles to understand the core concept.\n\nInstead of raw materials moving in a straight line from collection, through manufacturing, to purchase (and, once it's broken or used up, the trash can), imagine a loop. The materials are always moving through this loop, never reaching an endpoint.\n\nWhen a product has served its purpose, it restarts at collection. Someone pares the item back down to scraps, providing new raw materials. Then it's manufactured into a finished product yet again, one the consumer can then purchase.\n\nSOURCE: ISTOCK\n\n<https://reports.weforum.org/toward-the-circular-economy-accelerating-the-scale-up-across-global-supply-chains/from-linear-to-circular-accelerating-a-proven-concept/>\n\nThink of aluminum cans. When you finish drinking a beverage out of a can, you put it in a recycling bin. Factories salvage the aluminum and make another can that is shipped to a store, where anyone can buy it. The process can be repeated thousands of times.\n\nClosed-loop systems can be applied to all kinds of industries. For example, take the beer business. Sierra Nevada has closed the loop in the company's Chico, California facilities, where the beermakers compost waste generated from the brewery into soil used to grow new barley and hops.\n\nBut that's far from the only example. Companies like For Days are fighting the concept of fast fashion with closed loop clothing. When customers sign up for a For Days subscription, they receive a bundle of shirts, ranging from basic tank tops to sweatshirts.\n\nOnce the clothes are worn down, stained, or torn, subscribers send them back for a new set derived directly from those used threads.\n\nSierra Nevada empties used hops destined for the HotRot composting machine.\n\nSOURCE: SIERRA NEVADA\n\n<https://www.greenmatters.com/news/2017/09/15/ZloSdig/sierra-green>\n\n<https://fordays.com/>\n\n<https://www.facebook.com/sierranevadabeer/photos/a.101500>

96086127516.324137.12994977515/10152044081487516/?type=3&theater\n\nApple is also aiming to close tech loops with its plan to transition to 100 percent recycled\nproducts. The company has already taken some steps towards this goal with its give-back\nprogram, which encourages customers to return their old phones and computers. Those\nproducts can be stripped and remade into new ones, with the help of a special robot\nnamed Liam that Apple has tasked with the job.\nEssentially, a closed-loop system encourages companies to treat their products as\nresources, not disposable trash, and allows customers to participate in a circular economy\nthat maximizes every scrap of aluminum in your soda can, cotton in your T-shirt, or gold\nembedded in your iPhone camera.\nThis article, originally published on Aug. 15, 2018, has been

updated.\nhttps://www.greenmatters.com/news/2017/04/26/ZsVuaN/apple-recycled-materials\nhttps://www.greenmatters.com/news/2017/04/26/ZsVuaN/apple-recycled-materials\n\n", "extra": {"cited_message_idx": 8, "search_result_idx": null, "evidence_text": "source", "cloud_doc_url": null}}, {"start_ix": 1416, "end_ix": 1426, "citation_format_type": "tether_og", "metadata": {"type": "file", "name": "tactiq-free-transcript-fuKNaGhZE2Y - Copy.txt", "id": "file-1XWCrvkoDlmhtQotHNiD5qE3", "source": "my_files", "text": "# tactiq.io free youtube transcript\n# Smart Buildings Saving the World | Visiting Sustainable Architecture\n# https://www.youtube.com/watch/fuKNaGhZE2Y\n\n00:00:00.000 make sure you stick around to the end\n00:00:01.620 where I will reveal the world's smartest\n00:00:03.689 building when people ask me why I study\n00:00:06.330 architecture I show them this graph\n00:00:08.389 buildings are responsible for the most\n00:00:10.320 amount of carbon emissions out of all\n00:00:11.849 sectors but this doesn't have to be as\n00:00:14.040 we have the technology to make carbon\n00:00:15.929 neutral buildings we start in Barcelona\n00:00:18.630 where a building which looks like it's\n00:00:20.400 being wrapped in bubble wrap is actually\n00:00:22.260 a prime example of how we can use\n00:00:23.699 technology to make large buildings\n00:00:25.289 respect our environment the technology\n00:00:27.900 used on this building keeps the inside\n00:00:29.519 cool\n00:00:30.269 therefore dramatically reduces the need\n00:00:32.130 for air conditioning air conditioning in\n00:00:34.290 hot countries such as Spain can make up\n00:00:36.120 for 40% of the total building energy\n00:00:38.070 consumption just to cool the inside of a\n00:00:40.530 building that is far too much so how\n00:00:43.500 does the technology on this building\n00:00:44.850 work using sensors the building detects\n00:00:47.460 from the sun is shining on the facade\n00:00:48.960 and pumps nitrogen into the ETFE\n00:00:51.180 cushions which causes them to expand\n00:00:53.100 this creates a block between the heat of\n00:00:55.170 the Sun and the cool building interior\n00:00:57.090 in two different ways firstly on the\n00:00:59.160 south east facade the cushions create a\n00:01:01.050 positive reverse design which creates a\n00:01:03.120 shared effect inside secondly on the\n00:01:05.700 south west facade along the cushions\n00:01:07.710 insulate the building as the nitrogen\n00:01:09.299 acts as a cloud like solar filter this\n00:01:11.939 combination of design stops\n00:01:13.380 approximately 114 tons of co2 entering\n00:01:16.380 our atmosphere per year this is\n00:01:18.180 equivalent to planting over 5,000 trees\n00:01:20.130 every single year we also must use\n00:01:22.799 sustainable materials ET Fe is the\n00:01:25.350 polymer that was also used for Eden\n00:01:26.939 projects in the UK is 100% recyclable\n00:01:29.670 and requires minimal energy for\n00:01:31.380 transportation and installation due to\n00:01:33.540 being only 1%

of the way to plus this\n00:01:36.000 dramatically reduces the need for large\n00:01:37.710 supporting structures - finally the\n00:01:40.829 addition of a roof garden for extra\n00:01:42.329 insulation the solar panels for the\n00:01:44.070 generation of energy make this building\n00:01:45.990 excellent example of environmentally\n00:01:47.850 conscious architecture\n00:01:49.640 Roof Gardens aren't typically the main\n00:01:51.990 design feature of a building over this\n00:01:54.180 next building makes the sky forest the\n00:01:55.950 core design feature the capita green\n00:01:58.740 building in Singapore was designed\n00:02:00.600 around a simple concept with major\n00:02:02.159 benefits the building is crowned with a\n00:02:04.229 red flower light sculpture the pencils\n00:02:06.630 capture and guide the wind down is the\n00:02:08.310 building's cooling board which stems its\n00:02:10.348 way right down the core of the building\n00:02:11.640 this providing\n00:02:13.710 listening to all 40 stories a vastly\n00:02:16.260 reduced rate of energy consumption the\n00:02:18.120 era tuned in 42 meters high troubles at\n00:02:21.150 a high speed and is cooler and fresher\n00:02:23.010 due to the sky forest which has been\n00:02:24.780 planted the building does 55% of the\n00:02:27.780 exterior covered with lush foliage this\n00:02:30.060 not only reduces the solar heat gain\n00:02:31.740 also as a positive effects on the users\n00:02:33.900 within by promoting the sense of\n00:02:35.520 Biophilia this building the shown that\n00:02:38.460 using nature as a design inspiration is\n00:02:40.830 one of the best ways being combat\n00:02:42.270 climate change this next design can be\n00:02:45.300 best introduced by the mayor of London\n00:02:52.490 loon burger company have made a large\n00:02:54.960 after image using that ecological\n00:02:56.340 footprint in their buildings in total\n00:02:58.920 they have saved a massive 95 million\n00:03:00.750 dollars in operating costs have also\n00:03:02.610 drastically improved employees\n00:03:04.050 productivity this goes to show that\n00:03:06.150 smart buildings aren't just benefiting\n00:03:07.650 the planet they are also benefiting her\n00:03:09.540 economy and well-being to this building\n00:03:12.270 achieves such high sustainable\n00:03:13.560 credentials to use the new solutions it\n00:03:15.450 has for ventilation lighting power and\n00:03:17.580 water 4,000 integrated ceiling panels\n00:03:20.940 have been included with the petal leaf\n00:03:22.590 design the panels combine heating\n00:03:25.110 cooling lighting and acoustic functions\n00:03:27.240 and use 40% less energy than a typical\n00:03:29.430 office lighting system the building\n00:03:32.040 takes over 3.2 acres and yet can still\n00:03:34.440 be naturally ventilated usually\n00:03:36.480 buildings of the scale require high\n00:03:37.950 energy intensive mechanical ventilation\n00:03:39.750 systems over this building have the\n00:03:41.880 ability to breathe naturally the bronze\n00:03:44.340 fins and the Bussard hold vents which\n00:03:46.290 can open and close pulling air through\n00:03:47.970 the office space into the atrium and out\n00:03:49.950 of the roof the water conservation\n00:03:52.140 system saved 25 million litres of water\n00:03:54.630 each year enough to fill 10 Olympic\n00:03:57.120 swimming pools the building also has its\n00:03:59.460 own on-site combined heat and power\n00:04:00.930 system therefore the waste heat\n00:04:03.060 generated from creating energy be reused\n00:04:05.580 for heating and cooling the building\n00:04:06.920 this building the show and the design\n00:04:09.210 can be improved in almost every aspect\n00:04:10.650 to help save our environment but in\n00:04:12.960 order to have a big enough effect we\n00:04:14.760 need every new building to be designed\n00:04:16.380 in such a

thoughtful way finally the one you've all been waiting for the world's smartest building it is called the edge and it's located in Amsterdam the buildings orientation is based on the path of the Sun the HU invades the building in northern daylight while the solar panels on the southern Bussard collect the energy from the Sun these solar panels are then able to power all smartphones laptops and electric cars I find it amazing how your car can be powered while you're at work due to the solar panels on the side of your office building once inside the phone up that all employees have takes the forefront wherever you go the app knows your preferences for light and temperature its weeks the environment you step into according to 20 centimeters of accuracy this app tells the building system when rooms are unoccupied which means when the zero occupancy is next to zero energy use the building is learning everyday and because it is connected to the internet it is future proofed so they can add new sensors as technology advances in the future finally the building stays warm by pumping down warm water in the summer months almost 400 feet into the aquifer below it sits it insulated into the winter when it is sucked back out for heating our planning to build a lot more buildings like these and the next one will be smarter and the one after that will be smarter as well and we won't stop until all cities in the world are filled with buildings that are intelligent and that are not using any energy anymore

[Music]
"n", "extra": {"cited_message_idx": 9, "search_result_idx": null, "evidence_text": "source", "cloud_doc_url": null}}, {"start_ix": 1829, "end_ix": 1840, "citation_format_type": "tether_og", "metadata": {"type": "file", "name": "tactiq-free-transcript--dvFb2vC7_Y - Copy.txt", "id": "file-NwJDLZitlrzjlcjxCmywAzXj", "source": "my_files", "text": "# tactiq.io free youtube transcript\n# Green Architecture Saving the World | Visiting Sustainable Buildings from Across the Planet\n# https://www.youtube.com/watch/-dvFb2vC7_Y\nlast year i traveled across the world to see what humans are doing in order to fight climate change i've seen some of the world's greenest buildings and in this video i'll show you exactly how these amazing architectural designs are able to save our planet\nthe carbon footprint of all my flights is offset using the platform offset\nearth but before we get on any flights let me show you what's being done here in london living walls are being implemented across the capital city to help clean the air this is because toxic pollution can be incredibly high within the city centre green walls have the capability to absorb these harmful chemicals and in exchange they release pure oxygen they can even be placed indoors to increase the internal oxygen levels it is likely that green walls will be an integral part of our cities in the future as it is predicted that 75 of people will be living in cities

by\n00:00:57.840 this will be 3 billion more people\n00:00:59.760 moving into urban districts therefore we\n00:01:02.000 have to create the right infrastructure\n00:01:03.520 to cater for this increased demand\n00:01:06.000 over in china 400 000 people are dying\n00:01:08.479 every year prematurely due to the high\n00:01:10.479 pollution levels these levels can exceed\n00:01:12.960 50 times what the world health\n00:01:14.400 organization deems to be safe\n00:01:16.400 the source of the pollution is what\n00:01:17.680 should be sorted out first however green\n00:01:19.840 architecture can play an important role\n00:01:21.439 in providing clean air to the asian\n00:01:23.200 cities\n00:01:24.320 they are planning to develop entire\n00:01:26.080 forest cities in the louisiana region\n00:01:28.080 which can absorb 10 000 tons of co2\n00:01:30.400 annually and produce 900 tons of oxygen\n00:01:33.600 this is all being designed by the\n00:01:34.960 italian architect stefano beret who has\n00:01:37.360 already designed and built vertical\n00:01:38.720 forest over in milan\n00:01:40.400 these buildings are not only doing good\n00:01:41.840 for our physical health but also have a\n00:01:43.360 positive effect on our psychological\n00:01:45.040 well-being\n00:01:46.799 i traveled to barcelona as i was told\n00:01:48.799 they were creating green architecture to\n00:01:50.560 improve the psychological well-being of\n00:01:52.320 its citizens so i wanted to see if it\n00:01:54.399 actually made me feel any different\n00:01:56.960 the demolition of an old building in the\n00:01:58.880 city's less court district left an ugly\n00:02:01.200 dividing wall facing towards the streets\n00:02:03.520 this left a particularly negative impact\n00:02:05.360 on the city's landscape due to its high\n00:02:06.880 visibility the architect capela garcia\n00:02:09.840 came up with a solution to create a\n00:02:11.120 vertical garden which wraps around and\n00:02:12.959 attaches to the sides of the existing\n00:02:14.640 building the vertical garden softens the\n00:02:17.200 urban landscape and provides passersby\n00:02:19.200 with a connection to nature by\n00:02:21.120 strengthening this bond people have with\n00:02:22.800 nature it will encourage them to be more\n00:02:24.640 environmentally conscious of their own\n00:02:26.080 habits\n00:02:27.280 there is interior access to the vertical\n00:02:28.959 garden which allows maintenance to be\n00:02:30.560 done from the inside\n00:02:32.239 however the wall has a network of\n00:02:33.599 connected tubes so the plants are\n00:02:35.280 automatically fed with programmed doses\n00:02:37.120 of water and fertilizer\n00:02:38.959 it has created a new ecosystem it's even\n00:02:41.360 encouraging biodiversity it's provided a\n00:02:43.920 natural habitat to a variety of birds\n00:02:45.760 whose natural environment was once\n00:02:47.200 destroyed by urban development\n00:02:49.440 the bunker catalana building was the\n00:02:51.040 first green building to be built in\n00:02:52.400 barcelona the plants provide shade from\n00:02:54.640 the heat of the strong sun which\n00:02:56.239 dramatically reduces the air\n00:02:57.519 conditioning requirements inside of the\n00:02:59.040 building\n00:03:00.319 the plants wrap the entire building on\n00:03:02.159 each level providing natural shade to\n00:03:04.319 the offices behind\n00:03:06.560 it can also lower the external\n00:03:08.000 temperatures by up to seven degrees\n00:03:10.159 which can be extremely important in\n00:03:11.760 large cities that experience the heat\n00:03:13.599 island effect\n00:03:15.680 one city that experiences this effect in\n00:03:17.760 particularly is singapore which sits\n00:03:19.840 right by the equator\n00:03:21.680 this is a city that's taking green\n00:03:23.280 architecture to a whole new level the\n00:03:25.599 city has one of the highest population\n00:03:27.280 densities in the world however

before the 19th century it was covered in lush rainforest and the only inhabitants were animals who had perfectly adapted to the hot humid climate in the 19th century mass deforestation occurred and trees were replaced with concrete leading to the average temperature of the region to rise dramatically however in recent years there has been a resurgence of greenery within the city this has been an attempt to reduce the heat island effect within the city centre which is incredibly important with the overall climate getting warmer as we experience singapore is incredibly hot however the use of greenery and water features at the street level help keep us cool this greenery has been transferred into the architectural designs of the buildings the park royal hotel on pickering was designed as a hotel and garden the project has won numerous awards for sustainable and green efforts including the bca green mark platinum which is singapore's highest green rating the building reinforces singapore's tropical image and enhances the quality of life of its guests it does this by providing spaces where the guests can completely immerse themselves within nature it can also benefit those who are simply walking by and admiring the building even the concrete has been shaped to resemble natural forms the designers at woha refer to this as topographical architecture the stratified undulating layers of precast concrete wrap around the entire building and resemble the structure of the bedrock this shows that nature can not only be used for practicality and efficiency but can also be used as a design inspiration not far from this building is the oasia hotel which is a building entirely wrapped in a red skin this allows plants to grow in the facade in total the building hosts 54 species of plants and trees which help improve the biodiversity within the city [Music] the 190 metre tall building has large sections cut out which break up the facade and allow cross-ventilation into the building these garden spaces act as mini oasis in the center of the busy business district overall the green facade totals over 25 000 square meters and the plot of land the building sits on is only 2 500 square meters this means the building achieves an overall greenery replacement of more than 10 times the site area this will help address the huge loss of green spaces within the urban city center like other living facades it works with an enormous lung which generates oxygen and absorbs co2 it is also able to filter out dust fumes and pollution from the air the most famous tourist attraction within singapore is the super trees within the gardens by the bay the man-made structures are designed to emulate the biological behavior of trees at their trunks at information plucks which teach the public on the importance of trees

for our survival\n00:06:24.160 the 18 super trees within the gardens\n00:06:26.160 incorporate technologies such as cooling\n00:06:28.080 channels which help moderate the\n00:06:29.680 temperature of the surrounding\n00:06:30.720 environment they also hold photovoltaics\n00:06:33.199 to harvest energy for the evening light\n00:06:34.880 show\n00:06:36.479 ultimately singapore showcases fantastic\n00:06:38.800 examples of green architecture however\n00:06:41.199 it has been blessed with a climate which\n00:06:42.960 allows for plants to grow rapidly\n00:06:45.680 over in hamburg germany they are taking\n00:06:47.840 a more scientific approach to green\n00:06:49.440 architecture\n00:06:51.120 they are using algae and the process of\n00:06:53.120 photosynthesis to turn the sun's energy\n00:06:55.280 into fuel\n00:06:57.360 the algae rapidly grows within the glass\n00:06:59.360 panels it is then extracted and put into\n00:07:01.919 a bio-converter which turns the algae\n00:07:04.080 into biomass\n00:07:05.840 this biomass can then be used for a\n00:07:07.520 number of things it can be a source of\n00:07:09.520 food for humans or animals and it can\n00:07:11.599 even power cars but the main purpose is\n00:07:14.080 to create electricity and heat for the\n00:07:15.680 people living in the building\n00:07:18.000 whilst we were there we were told the\n00:07:19.440 process was actually producing so much\n00:07:21.280 energy that it can offer electricity to\n00:07:23.440 the surrounding buildings too\n00:07:26.319 finally my favorite green building that\n00:07:28.080 i visited on my travels was in\n00:07:29.520 copenhagen denmark\n00:07:31.280 here they are engaging the public\n00:07:32.800 directly with the energy sector\n00:07:34.960 this has been achieved by placing a ski\n00:07:36.800 slope on top of the cleanest waste\n00:07:38.400 energy power plant in the world\n00:07:40.639 we took the glass lift to the top which\n00:07:42.720 showed us inside the factory where 440\n00:07:45.120 000 tons of waste is being converted\n00:07:47.360 into clean energy annually\n00:07:49.520 once you reach the top you see the\n00:07:51.199 toxin-free steam being released which is\n00:07:53.440 said to be as fresh as mountain air\n00:07:55.680 you then see the start of one of the\n00:07:57.280 world's largest artificial ski slopes\n00:08:00.160 this building has shown that creating a\n00:08:02.000 sustainable future doesn't have to be\n00:08:03.759 limiting it can actually make our lives\n00:08:05.840 more enjoyable\n00:08:07.759 the architect jacques ingles hopes that\n00:08:09.840 this project will inspire those across\n00:08:11.520 the world to create architecture that\n00:08:13.440 can be both fun and save the environment\n00:08:17.039 green architecture does propose some\n00:08:18.879 problems however all of which have\n00:08:21.039 solutions\n00:08:22.240 it can lead to additional costs of\n00:08:23.840 construction but in the long term it can\n00:08:26.000 save a lot of money due to the greatly\n00:08:28.000 reduced air conditioning\n00:08:30.319 vegetation also adds more weight to the\n00:08:32.479 structure however if incorporated in the\n00:08:34.799 original designs this shouldn't be an\n00:08:36.799 issue\n00:08:37.679 as it is organic matter it can propose a\n00:08:40.080 fire hazard however as long as the\n00:08:41.919 irrigation system keeps the vegetation\n00:08:44.000 well watered this shouldn't be a problem\n00:08:47.200 my takeaways from this trip is that\n00:08:48.880 green architecture can be implemented\n00:08:50.720 pretty much anywhere i expect to see\n00:08:53.200 green architecture be used a lot more in\n00:08:55.120 the future to help with both pollution\n00:08:57.120 issues but also to help resolve climate\n00:08:59.279 change\n00:09:00.880 climate change is an issue which will\n00:09:02.480 affect us all however we have the\n00:09:04.480 technology right

now to prevent these\n00:09:06.320 horrific scenes from continuing so we\n00:09:08.560 must urge our governments to act and\n00:09:10.640 make sure that they use these\n00:09:11.839 technologies which are already having a\n00:09:13.600 positive impact around the world\n00:09:16.399 i hope that you've enjoyed this video on\n00:09:18.240 the world's greenest buildings if you\n00:09:20.320 want to see more interesting\n00:09:21.519 architecture\n00:09:22.399 be sure to watch my smart buildings\n00:09:23.920 video and also subscribe to see where\n00:09:26.160 i'll be visiting in the future\n00:09:28.160 thank you and i will see you in the next\n00:09:29.839 video\n\nThe file is too long and its contents have been truncated.\n", "extra": {"cited_message_idx": 11, "search_result_idx": null, "evidence_text": "source", "cloud_doc_url": null}}, {"start_ix": 2227, "end_ix": 2238, "citation_format_type": "tether_og", "metadata": {"type": "file", "name": "tactiq-free-transcript--dvFb2vC7_Y - Copy.txt", "id": "file-NwJDLZitlrzjlcjxCmywAzXj", "source": "my_files", "text": "# tactiq.io free youtube transcript\n# Green Architecture Saving the World | Visiting Sustainable Buildings from Across the Planet\n# https://www.youtube.com/watch/-dvFb2vC7_Y\n\nlast year i traveled across the world to\n00:00:02.399 see what humans are doing in order to\n00:00:03.919 fight climate change i've seen some of\n00:00:06.000 the world's greenest buildings and in\n00:00:08.080 this video i'll show you exactly how\n00:00:09.760 these amazing architectural designs are\n00:00:11.920 able to save our planet\n00:00:15.230 [Music]\n00:00:19.840 the carbon footprint of all my flights\n00:00:21.439 is offset using the platform offset\n00:00:23.279 earth\n00:00:24.480 but before we get on any flights let me\n00:00:26.480 show you what's being done here in\n00:00:27.840 london\n00:00:29.199 living walls are being implemented\n00:00:30.800 across the capital city to help clean\n00:00:32.719 the air this is because toxic pollution\n00:00:35.040 can be incredibly high within the city\n00:00:36.559 centre\n00:00:37.600 green walls have the capability to\n00:00:39.200 absorb these harmful chemicals and in\n00:00:41.280 exchange they release pure oxygen they\n00:00:44.000 can even be placed indoors to increase\n00:00:46.239 the internal oxygen levels\n00:00:48.640 it is likely that green walls will be an\n00:00:50.399 integral part of our cities in the\n00:00:51.920 future as it is predicted that 75 of\n00:00:54.480 people will be living in cities by\n00:00:57.840 this will be 3 billion more people\n00:00:59.760 moving into urban districts therefore we\n00:01:02.000 have to create the right infrastructure\n00:01:03.520 to cater for this increased demand\n00:01:06.000 over in china 400 000 people are dying\n00:01:08.479 every year prematurely due to the high\n00:01:10.479 pollution levels these levels can exceed\n00:01:12.960 50 times what the world health\n00:01:14.400 organization deems to be safe\n00:01:16.400 the source of the pollution is what\n00:01:17.680 should be sorted out first however green\n00:01:19.840 architecture can play an important role\n00:01:21.439 in providing clean air to the asian\n00:01:23.200 cities\n00:01:24.320 they are planning to develop entire\n00:01:26.080 forest cities in the louisiana region\n00:01:28.080 which can absorb 10 000 tons of co2\n00:01:30.400 annually and produce 900 tons of oxygen\n00:01:33.600 this is all being designed by the\n00:01:34.960 italian architect stefano beret who has\n00:01:37.360 already designed and built vertical\n00:01:38.720 forest over in milan\n00:01:40.400 these buildings are not only doing good\n00:01:41.840 for our physical health but also have a\n00:01:43.360 positive effect on our psychological\n00:01:45.040 well-being\n00:01:46.799 i traveled to barcelona as i was told\n00:01:48.799 they were creating green architecture

to improve the psychological well-being of its citizens so i wanted to see if it actually made me feel any different the demolition of an old building in the city's less court district left an ugly dividing wall facing towards the streets this left a particularly negative impact on the city's landscape due to its high visibility the architect capela garcia came up with a solution to create a vertical garden which wraps around and attaches to the sides of the existing building the vertical garden softens the urban landscape and provides passersby with a connection to nature by strengthening this bond people have with nature it will encourage them to be more environmentally conscious of their own habits there is interior access to the vertical garden which allows maintenance to be done from the inside however the wall has a network of connected tubes so the plants are automatically fed with programmed doses of water and fertilizer it has created a new ecosystem it's even encouraging biodiversity it's provided a natural habitat to a variety of birds whose natural environment was once destroyed by urban development the bunker catalana building was the first green building to be built in barcelona the plants provide shade from the heat of the strong sun which dramatically reduces the air conditioning requirements inside of the building the plants wrap the entire building on each level providing natural shade to the offices behind it it can also lower the external temperatures by up to seven degrees which can be extremely important in large cities that experience the heat island effect one city that experiences this effect in particular is singapore which sits right by the equator this is a city that's taking green architecture to a whole new level the city has one of the highest population densities in the world however before the 19th century it was covered in lush rainforest and the only inhabitants were animals who had perfectly adapted to the hot humid climate in the 19th century mass deforestation occurred and trees were replaced with concrete leading to the average temperature of the region to rise dramatically however in recent years there has been a resurgence of greenery within the city this has been an attempt to reduce the heat island effect within the city centre which is incredibly important with the overall climate getting warmer as we experience singapore is incredibly hot however the use of greenery and water features at the street level help keep us cool this greenery has been transferred into the architectural designs of the buildings the park royal hotel on pickering was designed as a hotel and garden the project has won numerous awards for sustainable and green efforts including the bca green mark platinum which is singapore's highest green rating

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was actually producing so much energy that it can offer electricity to the surrounding buildings too finally my favorite green building that i visited on my travels was in copenhagen denmark here they are engaging the public directly with the energy sector this has been achieved by placing a ski slope on top of the cleanest waste energy power plant in the world we took the glass lift to the top which showed us inside the factory where 440 000 tons of waste is being converted into clean energy annually once you reach the top you see the toxin-free steam being released which is said to be as fresh as mountain air you then see the start of one of the world's largest artificial ski slopes this building has shown that creating a sustainable future doesn't have to be limiting it can actually make our lives more enjoyable the architect jacques ingles hopes that this project will inspire those across the world to create architecture that can be both fun and save the environment green architecture does propose some problems however all of which have solutions it can lead to additional costs of construction but in the long term it can save a lot of money due to the greatly reduced air conditioning vegetation also adds more weight to the structure however if incorporated in the original designs this shouldn't be an issue as it is organic matter it can propose a fire hazard however as long as the irrigation system keeps the vegetation well watered this shouldn't be a problem my takeaways from this trip is that green architecture can be implemented pretty much anywhere i expect to see green architecture be used a lot more in the future to help with both pollution issues but also to help resolve climate change climate change is an issue which will affect us all however we have the technology right now to prevent these horrific scenes from continuing so we must urge our governments to act and make sure that they use these technologies which are already having a positive impact around the world i hope that you've enjoyed this video on the world's greenest buildings if you want to see more interesting architecture be sure to watch my smart buildings video and also subscribe to see where i'll be visiting in the future thank you and i will see you in the next video

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to\n00:00:03.919 fight climate change i've seen some of\n00:00:06.000 the world's greenest buildings and in\n00:00:08.080 this video i'll show you exactly how\n00:00:09.760 these amazing architectural designs are\n00:00:11.920 able to save our planet\n00:00:15.230 [Music]\n00:00:19.840 the carbon footprint of all my flights\n00:00:21.439 is offset using the platform offset\n00:00:23.279 earth\n00:00:24.480 but before we get on any flights let me\n00:00:26.480 show you what's being done here in\n00:00:27.840 london\n00:00:29.199 living walls are being implemented\n00:00:30.800 across the capital city to help clean\n00:00:32.719 the air this is because toxic pollution\n00:00:35.040 can be incredibly high within the city\n00:00:36.559 centre\n00:00:37.600 green walls have the capability to\n00:00:39.200 absorb these harmful chemicals and in\n00:00:41.280 exchange they release pure oxygen they\n00:00:44.000 can even be placed indoors to increase\n00:00:46.239 the internal oxygen levels\n00:00:48.640 it is likely that green walls will be an\n00:00:50.399 integral part of our cities in the\n00:00:51.920 future as it is predicted that 75 of\n00:00:54.480 people will be living in cities by\n00:00:57.840 this will be 3 billion more people\n00:00:59.760 moving into urban districts therefore we\n00:01:02.000 have to create the right infrastructure\n00:01:03.520 to cater for this increased demand\n00:01:06.000 over in china 400 000 people are dying\n00:01:08.479 every year prematurely due to the high\n00:01:10.479 pollution levels these levels can exceed\n00:01:12.960 50 times what the world health\n00:01:14.400 organization deems to be safe\n00:01:16.400 the source of the pollution is what\n00:01:17.680 should be sorted out first however green\n00:01:19.840 architecture can play an important role\n00:01:21.439 in providing clean air to the asian\n00:01:23.200 cities\n00:01:24.320 they are planning to develop entire\n00:01:26.080 forest cities in the louisiana region\n00:01:28.080 which can absorb 10 000 tons of co2\n00:01:30.400 annually and produce 900 tons of oxygen\n00:01:33.600 this is all being designed by the\n00:01:34.960 italian architect stefano beret who has\n00:01:37.360 already designed and built vertical\n00:01:38.720 forest over in milan\n00:01:40.400 these buildings are not only doing good\n00:01:41.840 for our physical health but also have a\n00:01:43.360 positive effect on our psychological\n00:01:45.040 well-being\n00:01:46.799 i traveled to barcelona as i was told\n00:01:48.799 they were creating green architecture to\n00:01:50.560 improve the psychological well-being of\n00:01:52.320 its citizens so i wanted to see if it\n00:01:54.399 actually made me feel any different\n00:01:56.960 the demolition of an old building in the\n00:01:58.880 city's less court district left an ugly\n00:02:01.200 dividing wall facing towards the streets\n00:02:03.520 this left a particularly negative impact\n00:02:05.360 on the city's landscape due to its high\n00:02:06.880 visibility the architect capela garcia\n00:02:09.840 came up with a solution to create a\n00:02:11.120 vertical garden which wraps around and\n00:02:12.959 attaches to the sides of the existing\n00:02:14.640 building the vertical garden softens the\n00:02:17.200 urban landscape and provides passersby\n00:02:19.200 with a connection to nature by\n00:02:21.120 strengthening this bond people have with\n00:02:22.800 nature it will encourage them to be more\n00:02:24.640 environmentally conscious of their own\n00:02:26.080 habits\n00:02:27.280 there is interior access to the vertical\n00:02:28.959 garden which allows maintenance to be\n00:02:30.560 done from the inside\n00:02:32.239 however the wall has a network of\n00:02:33.599 connected tubes so the plants are\n00:02:35.280 automatically fed with programmed doses\n00:02:37.120 of water and fertilizer\n00:02:38.959 it has created a new ecosystem it's even\n00:02:41.360

encouraging biodiversity it's provided a natural habitat to a variety of birds whose natural environment was once destroyed by urban development the bunker catalana building was the first green building to be built in barcelona the plants provide shade from the heat of the strong sun which dramatically reduces the air conditioning requirements inside of the building the plants wrap the entire building on each level providing natural shade to the offices behind it can also lower the external temperatures by up to seven degrees which can be extremely important in large cities that experience the heat island effect one city that experiences this effect in singapore which sits right by the equator this is a city that's taking green architecture to a whole new level the city has one of the highest population densities in the world however before the 19th century it was covered in lush rainforest and the only inhabitants were animals who had perfectly adapted to the hot humid climate in the 19th century mass deforestation occurred and trees were replaced with concrete leading to the average temperature of the region to rise dramatically however in recent years there has been a resurgence of greenery within the city this has been an attempt to reduce the heat island effect within the city centre which is incredibly important with the overall climate getting warmer as we experience singapore is incredibly hot however the use of greenery and water features at the street level help keep us cool this greenery has been transferred into the architectural designs of the buildings the park royal hotel on pickering was designed as a hotel and garden the project has won numerous awards for sustainable and green efforts including the bca green mark platinum which is singapore's highest green rating the building reinforces singapore's tropical image and enhances the quality of life of its guests it does this by providing spaces where the guests can completely immerse themselves within nature it can also benefit those who are simply walking by and admiring the building even the concrete has been shaped to resemble natural forms the designers at woha refer to this as topographical architecture the stratified undulating layers of precast concrete wrap around the entire building and resemble the structure of the bedrock this shows that nature can not only be used for practicality and efficiency but can also be used as a design inspiration not far from this building is the oasia hotel which is a building entirely wrapped in a red skin this allows plants to grow in the facade in total the building hosts 54 species of plants and trees which help improve the biodiversity within the city [Music] the 190 metre tall building has large sections cut out which break up

the facade and allow cross-ventilation into the building these garden spaces act as mini oasis in the center of the busy business district overall the green facade totals over 25 000 square meters and the plot of land the building sits on is only 2 500 square meters this means the building achieves an overall greenery replacement of more than 10 times the site area this will help address the huge loss of green spaces within the urban city center like other living facades it works with an enormous lung which generates oxygen and absorbs co₂ it is also able to filter out dust fumes and pollution from the air the most famous tourist attraction within singapore is the super trees within the gardens by the bay the man-made structures are designed to emulate the biological behavior of trees at their trunks at information plucks which teach the public on the importance of trees for our survival the 18 super trees within the gardens incorporate technologies such as cooling channels which help moderate the temperature of the surrounding environment they also hold photovoltaics to harvest energy for the evening light show ultimately singapore showcases fantastic examples of green architecture however it has been blessed with a climate which allows for plants to grow rapidly over in hamburg germany they are taking a more scientific approach to green architecture they are using algae and the process of photosynthesis to turn the sun's energy into fuel the algae rapidly grows within the glass panels it is then extracted and put into a bio-converter which turns the algae into biomass this biomass can then be used for a number of things it can be a source of food for humans or animals and it can even power cars but the main purpose is to create electricity and heat for the people living in the building whilst we were there we were told the process was actually producing so much energy that it can offer electricity to the surrounding buildings too finally my favorite green building that i visited on my travels was in copenhagen denmark here they are engaging the public directly with the energy sector this has been achieved by placing a ski slope on top of the cleanest waste energy power plant in the world we took the glass lift to the top which showed us inside the factory where 440 000 tons of waste is being converted into clean energy annually once you reach the top you see the toxin-free steam being released which is said to be as fresh as mountain air you then see the start of one of the world's largest artificial ski slopes this building has shown that creating a sustainable future doesn't have to be limiting it can actually make our lives more enjoyable the architect jacques ingles hopes that this project will inspire those across the world to create architecture that can be both fun and save the environment green

architecture does propose some problems however all of which have solutions it can lead to additional costs of construction but in the long term it can save a lot of money due to the greatly reduced air conditioning vegetation also adds more weight to the structure however if incorporated in the original designs this shouldn't be an issue as it is organic matter it can propose a fire hazard however as long as the irrigation system keeps the vegetation well watered this shouldn't be a problem my takeaways from this trip is that green architecture can be implemented pretty much anywhere i expect to see green architecture be used a lot more in the future to help with both pollution issues but also to help resolve climate change climate change is an issue which will affect us all however we have the technology right now to prevent these horrific scenes from continuing so we must urge our governments to act and make sure that they use these technologies which are already having a positive impact around the world i hope that you've enjoyed this video on the world's greenest buildings if you want to see more interesting architecture be sure to watch my smart buildings video and also subscribe to see where i'll be visiting in the future thank you and i will see you in the next video

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explained. So, what is a closed-loop system? The phrase "closed-loop system" is often paired with "circular economy," which is an industrial system that is restorative and regenerative by intention or design, to use the World Economic Forum's definition. It's helpful to think of literal loops or circles to understand the core concept. Instead of raw materials moving in a straight line from collection, through manufacturing, to purchase (and, once it's broken or used up, the trash can), imagine a loop. The materials are always moving through this loop, never reaching an endpoint. When a product has served its purpose, it restarts at collection. Someone pares the item back down to scraps, providing new raw materials. Then it's manufactured into a finished product yet again, one the consumer can then purchase. SOURCE: ISTOCK <https://reports.weforum.org/toward-the-circular-economy-accelerating-the-scale-up-across-global-supply-chains/from-linear-to-circular-accelerating-a-proven-concept/> Think of aluminum cans. When you finish drinking a beverage out of a can, you put it in a recycling bin. Factories salvage the aluminum and make another can that is shipped to a store, where anyone can buy it. The process can be repeated thousands of times. Closed-loop systems can be applied to all kinds of industries. For example, take the beer business. Sierra Nevada has closed the loop in the company's Chico, California facilities, where the beer makers compost waste generated from the brewery into soil used to grow new barley and hops. But that's far from the only example. Companies like For Days are fighting the concept of fast fashion with closed loop clothing. When customers sign up for a For Days subscription, they receive a bundle of shirts, ranging from basic tank tops to sweatshirts. Once the clothes are worn down, stained, or torn, subscribers send them back for a new set derived directly from those used threads. Sierra Nevada empties used hops destined for the HotRot composting machine. SOURCE: SIERRA

NEVADA <https://www.greenmatters.com/news/2017/09/15/Z1oSdig/sierra-green> <https://fordays.com/> <https://www.facebook.com/sierranevadabeer/photos/a.10150096086127516.324137.12994977515/10152044081487516/?type=3&theater> Apple is also aiming to close tech loops with its plan to transition to 100 percent recycled products. The company has already taken some steps towards this goal with its give-back program, which encourages customers to return their old phones and computers. Those products can be stripped and remade into new ones, with the help of a special robot named Liam that Apple has tasked with the job. Essentially, a closed-loop system encourages companies to treat their products as resources, not disposable trash, and allows customers to participate in a circular economy that maximizes every scrap of aluminum in your soda can, cotton in your T-shirt, or gold embedded in your iPhone camera. This article, originally published on Aug. 15, 2018, has been

updated. <https://www.greenmatters.com/news/2017/04/26/ZsVuaN/apple-recycled-materials> <https://www.greenmatters.com/news/2017/04/26/ZsVuaN/apple-recycled-materials>, "cloud_doc_url": null, {"matched_text": "u30108u2020sourceu3011", "start_idx": 971, "end_idx": 981, "alt": null, "type": "file", "name": "What's a Closed-Loop System Sustainability in the Supply Chain - Copy.pdf", "id": "file-9BmKyeEpGpzZtyHoFSxNI50X", "source": "my_files", "snippet": "What is a Closed-Loop System? How Companies Incorporate Sustainability into Production"} This sustainable business practice encourages companies to recycle and reuse the same raw materials for new products. BY KRISTIN HUNT FEB. 15 2024, UPDATED 3:44 P.M. ET Businesses

use all kinds of terms to prove they're environmentally friendly. Recyclable, plant-based, and energy efficient all get tossed around a lot and while most people generally know what those words mean, there's one frequently used phrase that's harder to decipher: closed-loop system. When a company says it uses a closed-loop system, it's referring to its supply chain. Under a closed-loop system, businesses reuse the same materials over and over again to

SOURCE: ISTOCK
<https://www.greenmatters.com/a/kristin-hunt>
<https://www.greenmatters.com/p/what-is-greenwashing>
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create new products for purchase. It's a way to conserve natural resources and divert waste from the landfill, and increasingly, more companies are adopting it. Here's everything you should know about closed-loop systems, explained. So, what is a closed-loop system? The phrase closed-loop system is often paired with circular economy, which is an industrial system that is restorative and regenerative by intention or design, to use the World Economic Forum's definition. It's helpful to think of literal loops or circles to understand the core concept. Instead of raw materials moving in a straight line from collection, through manufacturing, to purchase (and, once it's broken or used up, the trash can), imagine a loop. The materials are always moving through this loop, never reaching an endpoint. When a product has served its purpose, it restarts at collection. Someone pares the item back down to scraps, providing new raw materials. Then it's manufactured into a finished product yet again, one the consumer can then purchase.

SOURCE: ISTOCK
<https://reports.weforum.org/toward-the-circular-economy-accelerating-the-scale-up-across-global-supply-chains/from-linear-to-circular-accelerating-a-proven-concept/>

Think of aluminum cans. When you finish drinking a beverage out of a can, you put it in a recycling bin. Factories salvage the aluminum and make another can that is shipped to a store, where anyone can buy it. The process can be repeated thousands of times. Closed-loop systems can be applied to all kinds of industries. For example, take the beer business. Sierra Nevada has closed the loop in the company's Chico, California facilities, where the beermakers compost waste generated from the brewery into soil used to grow new barley and hops. But that's far from the only example. Companies like For Days are fighting the concept of fast fashion with closed loop clothing. When customers sign up for a For Days subscription, they receive a bundle of shirts, ranging from basic tank tops to sweatshirts. Once the clothes are worn down, stained, or torn, subscribers send them back for a new set derived directly from those used threads. Sierra Nevada empties used hops destined for the HotRot composting machine.

SOURCE: SIERRA NEVADA
<https://www.greenmatters.com/news/2017/09/15/ZloSdig/sierra-green>
<https://fordays.com>
<https://www.facebook.com/sierranevadabeer/photos/a.10150096086127516.324137.12994977515/10152044081487516/?type=3&theater>

Apple is also aiming to close tech loops with its plan to transition to 100 percent recycled products. The company has already taken some steps towards this goal with its give-back program, which encourages customers to return their old phones and computers. Those products can be stripped and remade into new ones, with the help of a special robot named Liam that Apple has tasked with the job. Essentially, a closed-loop system encourages companies to treat their products as resources, not

disposable trash, and allows customers to participate in a circular economy\n\nthat maximizes every scrap of aluminum in your soda can, cotton in your T-shirt, or gold\n\nembedded in your iPhone camera.\n\nThis article, originally published on Aug. 15, 2018, has been updated.\n\n<https://www.greenmatters.com/news/2017/04/26/ZsVuaN/apple-recycled-materials>\n\n", "cloud_doc_url": null}, {"matched_text": "\u3010source\u3011", "start_idx": 1416, "end_idx": 1426, "alt": null, "type": "file", "name": "tactiq-free-transcript-fuKNaGhZE2Y - Copy.txt", "id": "file-1XWCrvkoDlmhtQotHNiD5qE3", "source": "my_files", "snippet": "# tactiq.io free youtube transcript\n# Smart Buildings Saving the World | Visiting Sustainable Architecture\n# https://www.youtube.com/watch/fuKNaGhZE2Y\n\n00:00:00.000 make sure you stick around to the end\n00:00:01.620 where I will reveal the world's smartest\n00:00:03.689 building when people ask me why I study\n00:00:06.330 architecture I show them this graph\n00:00:08.389 buildings are responsible for the most\n00:00:10.320 amount of carbon emissions out of all\n00:00:11.849 sectors but this doesn't have to be as\n00:00:14.040 we have the technology to make carbon\n00:00:15.929 neutral buildings we start in Barcelona\n00:00:18.630 where a building which looks like it\n00:00:20.400 being wrapped in bubble wrap is actually\n00:00:22.260 a prime example of how we can use\n00:00:23.699 technology to make large buildings\n00:00:25.289 respect our environment the technology\n00:00:27.900 used on this building keeps the inside\n00:00:29.519 cool\n00:00:30.269 therefore dramatically reduces the need\n00:00:32.130 for air conditioning air conditioning in\n00:00:34.290 hot countries such as Spain can make up\n00:00:36.120 for 40% of the total building energy\n00:00:38.070 consumption just to cool the inside of a\n00:00:40.530 building that is far too much so how\n00:00:43.500 does the technology on this building\n00:00:44.850 work using sensors the building detects\n00:00:47.460 from the sun is shining on the facade\n00:00:48.960 and pumps nitrogen into the ETFE\n00:00:51.180 cushions which causes them to expand\n00:00:53.100 this creates a block between the heat of\n00:00:55.170 the Sun and the cool building interior\n00:00:57.090 in two different ways firstly on the\n00:00:59.160 south east facade the cushions create a\n00:01:01.050 positive reverse design which creates a\n00:01:03.120 shared effect inside secondly on the\n00:01:05.700 south west facade along the cushions\n00:01:07.710 insulate the building as the nitrogen\n00:01:09.299 acts as a cloud like solar filter this\n00:01:11.939 combination of design stops\n00:01:13.380 approximately 114 tons of co2 entering\n00:01:16.380 our atmosphere per year this is\n00:01:18.180 equivalent to planting over 5,000 trees\n00:01:20.130 every single year we also must use\n00:01:22.799 sustainable materials ET Fe is the\n00:01:25.350 polymer that was also used for Eden\n00:01:26.939 projects in the UK is 100% recyclable\n00:01:29.670 and requires minimal energy for\n00:01:31.380 transportation and installation due to\n00:01:33.540 being only 1% of the way to plus this\n00:01:36.000 dramatically reduces the need for large\n00:01:37.710 supporting structures - finally the\n00:01:40.829 addition of a roof garden for extra\n00:01:42.329 insulation the solar panels for the\n00:01:44.070 generation of energy make this building\n00:01:45.990 excellent example of environmentally\n00:01:47.850 conscious architecture\n00:01:49.640 Roof Gardens aren't typically the main\n00:01:51.990 design feature of a building over this\n00:01:54.180 next building makes the sky forest the\n00:01:55.950 core design feature the capita green\n00:01:58.740 building in Singapore was

designed around a simple concept with major benefits the building is crowned with a red flower light sculpture the pencils capture and guide the wind down is the building's cooling board which stems its way right down the core of the building this providing listening to all 40 stories a vastly reduced rate of energy consumption the era tuned in 42 meters high troubles at a high speed and is cooler and fresher due to the sky forest which has been planted the building does 55% of the exterior covered with lush foliage this not only reduces the solar heat gain also as a positive effects on the users within by promoting the sense of Biophilia this building the shown that using nature as a design inspiration is one of the best ways being combat climate change this next design can be best introduced by the mayor of London loon burger company have made a large after image using that ecological footprint in their buildings in total they have saved a massive 95 million dollars in operating costs have also drastically improved employees productivity this goes to show that smart buildings aren't just benefiting the planet they are also benefiting her economy and well-being to this building achieves such high sustainable credentials to use the new solutions it has for ventilation lighting power and water 4,000 integrated ceiling panels have been included with the petal leaf design the panels combine heating cooling lighting and acoustic functions and use 40% less energy than a typical office lighting system the building takes over 3.2 acres and yet can still be naturally ventilated usually buildings of the scale require high energy intensive mechanical ventilation systems over this building have the ability to breathe naturally the bronze fins and the Bussard hold vents which can open and close pulling air through the office space into the atrium and out of the roof the water conservation system saved 25 million litres of water each year enough to fill 10 Olympic swimming pools the building also has its own on-site combined heat and power system therefore the waste heat generated from creating energy be reused for heating and cooling the building this building the show and the design can be improved in almost every aspect to help save our environment but in order to have a big enough effect we need every new building to be designed in such a thoughtful way finally the one you've all been waiting for the world's smartest building it is called the edge and it's located in Amsterdam the buildings orientation is based on the path of the Sun the HU invades the building in northern daylight while the solar panels on the southern Bussard collects the energy from the Sun these solar panels are then able to power all smartphones laptops and electric cars I find it amazing how your car can be powered while you're

at\n00:04:44.520 work due to the solar panels on the side\n00:04:46.439 of your office building once inside the\n00:04:49.409 phone up that all employees have takes\n00:04:51.029 the forefront wherever you go the app\n00:04:52.889 knows your preferences for light and\n00:04:54.270 temperature its weeks the environment\n00:04:56.099 you step into according to 20\n00:04:57.569 centimeters of accuracy this app tells\n00:05:00.539 the building system when rooms are\n00:05:01.889 unoccupied which means when the zero\n00:05:03.779 occupancy is next to zero energy use the\n00:05:07.289 building is learning everyday and\n00:05:08.789 because it is connected to the internet\n00:05:10.229 it is future proofed so they can add new\n00:05:12.240 sensors as technology advances in the\n00:05:13.919 future finally the building stays warm\n00:05:16.469 by pumping down warm water in the summer\n00:05:18.330 months almost 400 feet into the aquifer\n00:05:20.460 below it sits it insulated into the\n00:05:23.279 winter when it is sucked back out for\n00:05:25.169 heating our planning to build a lot more\n00:05:28.860 buildings like these and the next one\n00:05:30.659 will be smarter and the one after that\n00:05:32.339 will be smarter as well and we won't\n00:05:34.740 stop until all cities in the world are\n00:05:37.199 filled with buildings that are\n00:05:38.250 intelligent and that are not using any\n00:05:40.169 energy anymore\n00:05:40.820 [Music]\n", "cloud_doc_url": null}, {"matched_text": "\u301011\u2020source\u3011", "start_idx": 1829, "end_idx": 1840, "alt": null, "type": "file", "name": "tactiq-free-transcript--dvFb2vC7_Y - Copy.txt", "id": "file-NwJDLZitlrzjlcjxCmywAzXj", "source": "my_files", "snippet": "# tactiq.io free youtube transcript\n# Green Architecture Saving the World | Visiting Sustainable Buildings from Across the Planet\n# https://www.youtube.com/watch/-dvFb2vC7_Y\n\n00:00:00.480 last year i traveled across the world to\n00:00:02.399 see what humans are doing in order to\n00:00:03.919 fight climate change i've seen some of\n00:00:06.000 the world's greenest buildings and in\n00:00:08.080 this video i'll show you exactly how\n00:00:09.760 these amazing architectural designs are\n00:00:11.920 able to save our planet\n00:00:15.230 [Music]\n00:00:19.840 the carbon footprint of all my flights\n00:00:21.439 is offset using the platform offset\n00:00:23.279 earth\n00:00:24.480 but before we get on any flights let me\n00:00:26.480 show you what's being done here in\n00:00:27.840 london\n00:00:29.199 living walls are being implemented\n00:00:30.800 across the capital city to help clean\n00:00:32.719 the air this is because toxic pollution\n00:00:35.040 can be incredibly high within the city\n00:00:36.559 centre\n00:00:37.600 green walls have the capability to\n00:00:39.200 absorb these harmful chemicals and in\n00:00:41.280 exchange they release pure oxygen they\n00:00:44.000 can even be placed indoors to increase\n00:00:46.239 the internal oxygen levels\n00:00:48.640 it is likely that green walls will be an\n00:00:50.399 integral part of our cities in the\n00:00:51.920 future as it is predicted that 75 of\n00:00:54.480 people will be living in cities by\n00:00:57.840 this will be 3 billion more people\n00:00:59.760 moving into urban districts therefore we\n00:01:02.000 have to create the right infrastructure\n00:01:03.520 to cater for this increased demand\n00:01:06.000 over in china 400 000 people are dying\n00:01:08.479 every year prematurely due to the high\n00:01:10.479 pollution levels these levels can exceed\n00:01:12.960 50 times what the world health\n00:01:14.400 organization deems to be safe\n00:01:16.400 the source of the pollution is what\n00:01:17.680 should be sorted out first however green\n00:01:19.840 architecture can play an important role\n00:01:21.439 in providing clean air to the asian\n00:01:23.200 cities\n00:01:24.320 they are planning to develop

entire\n00:01:26.080 forest cities in the louisiana region\n00:01:28.080 which can absorb 10 000 tons of co2\n00:01:30.400 annually and produce 900 tons of oxygen\n00:01:33.600 this is all being designed by the\n00:01:34.960 italian architect stefano beret who has\n00:01:37.360 already designed and built vertical\n00:01:38.720 forest over in milan\n00:01:40.400 these buildings are not only doing good\n00:01:41.840 for our physical health but also have a\n00:01:43.360 positive effect on our psychological\n00:01:45.040 well-being\n00:01:46.799 i traveled to barcelona as i was told\n00:01:48.799 they were creating green architecture to\n00:01:50.560 improve the psychological well-being of\n00:01:52.320 its citizens so i wanted to see if it\n00:01:54.399 actually made me feel any different\n00:01:56.960 the demolition of an old building in the\n00:01:58.880 city's less court district left an ugly\n00:02:01.200 dividing wall facing towards the streets\n00:02:03.520 this left a particularly negative impact\n00:02:05.360 on the city's landscape due to its high\n00:02:06.880 visibility the architect capela garcia\n00:02:09.840 came up with a solution to create a\n00:02:11.120 vertical garden which wraps around and\n00:02:12.959 attaches to the sides of the existing\n00:02:14.640 building the vertical garden softens the\n00:02:17.200 urban landscape and provides passersby\n00:02:19.200 with a connection to nature by\n00:02:21.120 strengthening this bond people have with\n00:02:22.800 nature it will encourage them to be more\n00:02:24.640 environmentally conscious of their own\n00:02:26.080 habits\n00:02:27.280 there is interior access to the vertical\n00:02:28.959 garden which allows maintenance to be\n00:02:30.560 done from the inside\n00:02:32.239 however the wall has a network of\n00:02:33.599 connected tubes so the plants are\n00:02:35.280 automatically fed with programmed doses\n00:02:37.120 of water and fertilizer\n00:02:38.959 it has created a new ecosystem it's even\n00:02:41.360 encouraging biodiversity it's provided a\n00:02:43.920 natural habitat to a variety of birds\n00:02:45.760 whose natural environment was once\n00:02:47.200 destroyed by urban development\n00:02:49.440 the bunker catalana building was the\n00:02:51.040 first green building to be built in\n00:02:52.400 barcelona the plants provide shade from\n00:02:54.640 the heat of the strong sun which\n00:02:56.239 dramatically reduces the air\n00:02:57.519 conditioning requirements inside of the\n00:02:59.040 building\n00:03:00.319 the plants wrap the entire building on\n00:03:02.159 each level providing natural shade to\n00:03:04.319 the offices behind\n00:03:06.560 it can also lower the external\n00:03:08.000 temperatures by up to seven degrees\n00:03:10.159 which can be extremely important in\n00:03:11.760 large cities that experience the heat\n00:03:13.599 island effect\n00:03:15.680 one city that experiences this effect in\n00:03:17.760 particularly is singapore which sits\n00:03:19.840 right by the equator\n00:03:21.680 this is a city that's taking green\n00:03:23.280 architecture to a whole new level the\n00:03:25.599 city has one of the highest population\n00:03:27.280 densities in the world however before\n00:03:29.200 the 19th century it was covered in lush\n00:03:31.120 rainforest and the only inhabitants were\n00:03:33.360 animals who had perfectly adapted to the\n00:03:35.120 hot humid climate\n00:03:38.239 in the 19th century mass deforestation\n00:03:40.480 occurred and trees were replaced with\n00:03:42.319 concrete leading to the average\n00:03:44.159 temperature of the region to rise\n00:03:45.680 dramatically however in recent years\n00:03:48.000 there has been a resurgence of greenery\n00:03:49.599 within the city\n00:03:50.879 this has been an attempt to reduce the\n00:03:52.400 heat island effect within the city\n00:03:53.840 centre which is incredibly important\n00:03:55.680 with the overall climate getting

warmer\n00:03:58.080 as we experience singapore is incredibly\n00:04:00.319 hot however the use of greenery and\n00:04:02.799 water features at the street level help\n00:04:04.799 keep us cool\n00:04:06.879 this greenery has been transferred into\n00:04:08.560 the architectural designs of the\n00:04:09.920 buildings\n00:04:11.599 the park royal hotel on pickering was\n00:04:13.840 designed as a hotel and garden the\n00:04:16.000 project has won numerous awards for\n00:04:17.759 sustainable and green efforts including\n00:04:19.759 the bca green mark platinum which is\n00:04:21.918 singapore's highest green rating the\n00:04:24.160 building reinforces singapore's tropical\n00:04:26.320 image and enhances the quality of life\n00:04:28.240 of its guests\n00:04:29.520 it does this by providing spaces where\n00:04:31.440 the guests can completely immerse\n00:04:32.960 themselves within nature\n00:04:34.800 it can also benefit those who are simply\n00:04:36.720 walking by and admiring the building\n00:04:40.080 even the concrete has been shaped to\n00:04:41.680 resemble natural forms the designers at\n00:04:44.080 woha refer to this as topographical\n00:04:46.000 architecture the stratified undulating\n00:04:48.240 layers of precast concrete wrap around\n00:04:50.400 the entire building and resemble the\n00:04:52.240 structure of the bedrock\n00:04:54.160 this shows that nature can not only be\n00:04:55.840 used for practicality and efficiency but\n00:04:57.840 can also be used as a design inspiration\n00:05:01.759 not far from this building is the oasia\n00:05:03.680 hotel which is a building entirely\n00:05:05.680 wrapped in a red skin\n00:05:07.440 this allows plants to grow in\n00:05:09.120 the facade in total the building hosts\n00:05:11.520 54 species of plants and trees which\n00:05:14.000 help improve the biodiversity within the\n00:05:16.000 city\n00:05:16.560 [Music]\n00:05:17.759 the 190 metre tall building has large\n00:05:20.320 sections cut out which break up the\n00:05:22.080 facade and allow cross-ventilation into\n00:05:24.320 the building\n00:05:26.639 these garden spaces act as mini oasis in\n00:05:29.840 the center of the busy business district\n00:05:33.759 overall the green facade totals over 25\n00:05:36.880 000 square meters\n00:05:38.800 and the plot of land the building sits\n00:05:40.720 on is only 2 500 square meters\n00:05:44.240 this means the building achieves an\n00:05:45.680 overall greenery replacement of more\n00:05:47.280 than 10 times the site area this will\n00:05:49.680 help address the huge loss of green\n00:05:51.280 spaces within the urban city center\n00:05:54.880 like other living facades it works with\n00:05:56.639 an enormous lung which generates oxygen\n00:05:59.039 and absorbs co2\n00:06:01.520 it is also able to filter out dust fumes\n00:06:04.479 and pollution from the air\n00:06:07.120 the most famous tourist attraction\n00:06:08.800 within singapore is the super trees\n00:06:11.039 within the gardens by the bay\n00:06:13.520 the man-made structures are designed to\n00:06:15.280 emulate the biological behavior of trees\n00:06:18.080 at their trunks at information plucks\n00:06:19.840 which teach the public on the importance\n00:06:21.520 of trees for our survival\n00:06:24.160 the 18 super trees within the gardens\n00:06:26.160 incorporate technologies such as cooling\n00:06:28.080 channels which help moderate the\n00:06:29.680 temperature of the surrounding\n00:06:30.720 environment they also hold photovoltaics\n00:06:33.199 to harvest energy for the evening light\n00:06:34.880 show\n00:06:36.479 ultimately singapore showcases fantastic\n00:06:38.800 examples of green architecture however\n00:06:41.199 it has been blessed with a climate which\n00:06:42.960 allows for plants to grow rapidly\n00:06:45.680 over in hamburg germany they are taking\n00:06:47.840 a more scientific approach to green\n00:06:49.440 architecture\n00:06:51.120 they are using algae and the process

of\n00:06:53.120 photosynthesis to turn the sun's energy\n00:06:55.280 into fuel\n00:06:57.360 the algae rapidly grows within the glass\n00:06:59.360 panels it is then extracted and put into\n00:07:01.919 a bio-converter which turns the algae\n00:07:04.080 into biomass\n00:07:05.840 this biomass can then be used for a\n00:07:07.520 number of things it can be a source of\n00:07:09.520 food for humans or animals and it can\n00:07:11.599 even power cars but the main purpose is\n00:07:14.080 to create electricity and heat for the\n00:07:15.680 people living in the building\n00:07:18.000 whilst we were there we were told the\n00:07:19.440 process was actually producing so much\n00:07:21.280 energy that it can offer electricity to\n00:07:23.440 the surrounding buildings too\n00:07:26.319 finally my favorite green building that\n00:07:28.080 i visited on my travels was in\n00:07:29.520 copenhagen denmark\n00:07:31.280 here they are engaging the public\n00:07:32.800 directly with the energy sector\n00:07:34.960 this has been achieved by placing a ski\n00:07:36.800 slope on top of the cleanest waste\n00:07:38.400 energy power plant in the world\n00:07:40.639 we took the glass lift to the top which\n00:07:42.720 showed us inside the factory where 440\n00:07:45.120 000 tons of waste is being converted\n00:07:47.360 into clean energy annually\n00:07:49.520 once you reach the top you see the\n00:07:51.199 toxin-free steam being released which is\n00:07:53.440 said to be as fresh as mountain air\n00:07:55.680 you then see the start of one of the\n00:07:57.280 world's largest artificial ski slopes\n00:08:00.160 this building has shown that creating a\n00:08:02.000 sustainable future doesn't have to be\n00:08:03.759 limiting it can actually make our lives\n00:08:05.840 more enjoyable\n00:08:07.759 the architect jacques ingles hopes that\n00:08:09.840 this project will inspire those across\n00:08:11.520 the world to create architecture that\n00:08:13.440 can be both fun and save the environment\n00:08:17.039 green architecture does propose some\n00:08:18.879 problems however all of which have\n00:08:21.039 solutions\n00:08:22.240 it can lead to additional costs of\n00:08:23.840 construction but in the long term it can\n00:08:26.000 save a lot of money due to the greatly\n00:08:28.000 reduced air conditioning\n00:08:30.319 vegetation also adds more weight to the\n00:08:32.479 structure however if incorporated in the\n00:08:34.799 original designs this shouldn't be an\n00:08:36.799 issue\n00:08:37.679 as it is organic matter it can propose a\n00:08:40.080 fire hazard however as long as the\n00:08:41.919 irrigation system keeps the vegetation\n00:08:44.000 well watered this shouldn't be a problem\n00:08:47.200 my takeaways from this trip is that\n00:08:48.880 green architecture can be implemented\n00:08:50.720 pretty much anywhere i expect to see\n00:08:53.200 green architecture be used a lot more in\n00:08:55.120 the future to help with both pollution\n00:08:57.120 issues but also to help resolve climate\n00:08:59.279 change\n00:09:00.880 climate change is an issue which will\n00:09:02.480 affect us all however we have the\n00:09:04.480 technology right now to prevent these\n00:09:06.320 horrific scenes from continuing so we\n00:09:08.560 must urge our governments to act and\n00:09:10.640 make sure that they use these\n00:09:11.839 technologies which are already having a\n00:09:13.600 positive impact around the world\n00:09:16.399 i hope that you've enjoyed this video on\n00:09:18.240 the world's greenest buildings if you\n00:09:20.320 want to see more interesting\n00:09:21.519 architecture\n00:09:22.399 be sure to watch my smart buildings\n00:09:23.920 video and also subscribe to see where\n00:09:26.160 i'll be visiting in the future\n00:09:28.160 thank you and i will see you in the next\n00:09:29.839 video\n\nThe file is too long and its contents have been

truncated.\n", "cloud_doc_url": null}, {"matched_text": "\u3010source\u3011", "start_idx": 2227, "end_idx": 2238, "alt": null, "type": "file", "name": "tactiq-free-transcript--dvFb2vC7_Y - Copy.txt", "id": "file-NwJDLZitlrzjlcjxCmywAzXj", "source": "my_files", "snippet": "# tactiq.io free youtube transcript\n# Green Architecture Saving the World | Visiting Sustainable Buildings from Across the Planet\n# https://www.youtube.com/watch/-dvFb2vC7_Y\n# last year i traveled across the world to see what humans are doing in order to fight climate change i've seen some of the world's greenest buildings and in this video i'll show you exactly how these amazing architectural designs are able to save our planet\n# [Music]\n# the carbon footprint of all my flights is offset using the platform offset\n# earth but before we get on any flights let me show you what's being done here in london\n# living walls are being implemented across the capital city to help clean the air this is because toxic pollution can be incredibly high within the city centre\n# green walls have the capability to absorb these harmful chemicals and in exchange they release pure oxygen they can even be placed indoors to increase the internal oxygen levels\n# it is likely that green walls will be an integral part of our cities in the future as it is predicted that 75 of people will be living in cities by this will be 3 billion more people moving into urban districts therefore we have to create the right infrastructure to cater for this increased demand over in china 400 000 people are dying every year prematurely due to the high pollution levels these levels can exceed 50 times what the world health organization deems to be safe\n# the source of the pollution is what should be sorted out first however green architecture can play an important role in providing clean air to the asian cities\n# they are planning to develop entire forest cities in the louisiana region which can absorb 10 000 tons of co2 annually and produce 900 tons of oxygen\n# this is all being designed by the italian architect stefano beret who has already designed and built vertical forest over in milan\n# these buildings are not only doing good for our physical health but also have a positive effect on our psychological well-being\n# i traveled to barcelona as i was told they were creating green architecture to improve the psychological well-being of its citizens so i wanted to see if it actually made me feel any different\n# the demolition of an old building in the city's less court district left an ugly dividing wall facing towards the streets\n# this left a particularly negative impact on the city's landscape due to its high visibility the architect capela garcia came up with a solution to create a vertical garden which wraps around and attaches to the sides of the existing building the vertical garden softens the urban landscape and provides passersby with a connection to nature by strengthening

this bond people have with nature it will encourage them to be more environmentally conscious of their own habits there is interior access to the vertical garden which allows maintenance to be done from the inside however the wall has a network of connected tubes so the plants are automatically fed with programmed doses of water and fertilizer it has created a new ecosystem it's even encouraging biodiversity it's provided a natural habitat to a variety of birds whose natural environment was once destroyed by urban development the bunker catalana building was the first green building to be built in barcelona the plants provide shade from the heat of the strong sun which dramatically reduces the air conditioning requirements inside of the building the plants wrap the entire building on each level providing natural shade to the offices behind it it can also lower the external temperatures by up to seven degrees which can be extremely important in large cities that experience the heat island effect one city that experiences this effect in particular is singapore which sits right by the equator this is a city that's taking green architecture to a whole new level the city has one of the highest population densities in the world however before the 19th century it was covered in lush rainforest and the only inhabitants were animals who had perfectly adapted to the hot humid climate in the 19th century mass deforestation occurred and trees were replaced with concrete leading to the average temperature of the region to rise dramatically however in recent years there has been a resurgence of greenery within the city this has been an attempt to reduce the heat island effect within the city centre which is incredibly important with the overall climate getting warmer as we experience singapore is incredibly hot however the use of greenery and water features at the street level help keep us cool this greenery has been transferred into the architectural designs of the buildings the park royal hotel on pickering was designed as a hotel and garden the project has won numerous awards for sustainable and green efforts including the bca green mark platinum which is singapore's highest green rating the building reinforces singapore's tropical image and enhances the quality of life of its guests it does this by providing spaces where the guests can completely immerse themselves within nature it can also benefit those who are simply walking by and admiring the building even the concrete has been shaped to resemble natural forms the designers at woha refer to this as topographical architecture the stratified undulating layers of precast concrete wrap around the entire building and resemble the structure of the bedrock this shows that nature can not only be used

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said to be as fresh as mountain air\n00:07:55.680 you then see the start of one of the\n00:07:57.280 world's largest artificial ski slopes\n00:08:00.160 this building has shown that creating a\n00:08:02.000 sustainable future doesn't have to be\n00:08:03.759 limiting it can actually make our lives\n00:08:05.840 more enjoyable\n00:08:07.759 the architect jacques ingles hopes that\n00:08:09.840 this project will inspire those across\n00:08:11.520 the world to create architecture that\n00:08:13.440 can be both fun and save the environment\n00:08:17.039 green architecture does propose some\n00:08:18.879 problems however all of which have\n00:08:21.039 solutions\n00:08:22.240 it can lead to additional costs of\n00:08:23.840 construction but in the long term it can\n00:08:26.000 save a lot of money due to the greatly\n00:08:28.000 reduced air conditioning\n00:08:30.319 vegetation also adds more weight to the\n00:08:32.479 structure however if incorporated in the\n00:08:34.799 original designs this shouldn't be an\n00:08:36.799 issue\n00:08:37.679 as it is organic matter it can propose a\n00:08:40.080 fire hazard however as long as the\n00:08:41.919 irrigation system keeps the vegetation\n00:08:44.000 well watered this shouldn't be a problem\n00:08:47.200 my takeaways from this trip is that\n00:08:48.880 green architecture can be implemented\n00:08:50.720 pretty much anywhere i expect to see\n00:08:53.200 green architecture be used a lot more in\n00:08:55.120 the future to help with both pollution\n00:08:57.120 issues but also to help resolve climate\n00:08:59.279 change\n00:09:00.880 climate change is an issue which will\n00:09:02.480 affect us all however we have the\n00:09:04.480 technology right now to prevent these\n00:09:06.320 horrific scenes from continuing so we\n00:09:08.560 must urge our governments to act and\n00:09:10.640 make sure that they use these\n00:09:11.839 technologies which are already having a\n00:09:13.600 positive impact around the world\n00:09:16.399 i hope that you've enjoyed this video on\n00:09:18.240 the world's greenest buildings if you\n00:09:20.320 want to see more interesting\n00:09:21.519 architecture\n00:09:22.399 be sure to watch my smart buildings\n00:09:23.920 video and also subscribe to see where\n00:09:26.160 i'll be visiting in the future\n00:09:28.160 thank you and i will see you in the next\n00:09:29.839 video\n\nThe file is too long and its contents have been truncated.\n", "cloud_doc_url": null}, {"matched_text": "\u3011\u2020source\u3011", "start_idx": 2639, "end_idx": 2650, "alt": null, "type": "file", "name": "tactiq-free-transcript--dvFb2vC7_Y - Copy.txt", "id": "file-NwJDLZitlrzjlcjxCmywAzXj", "source": "my_files", "snippet": "# tactiq.io free youtube transcript\n# Green Architecture Saving the World | Visiting Sustainable Buildings from Across the Planet\n# https://www.youtube.com/watch/-dvFb2vC7_Y\n\nlast year i traveled across the world to\n00:00:02.399 see what humans are doing in order to\n00:00:03.919 fight climate change i've seen some of\n00:00:06.000 the world's greenest buildings and in\n00:00:08.080 this video i'll show you exactly how\n00:00:09.760 these amazing architectural designs are\n00:00:11.920 able to save our planet\n00:00:15.230 [Music]\n00:00:19.840 the carbon footprint of all my flights\n00:00:21.439 is offset using the platform offset\n00:00:23.279 earth\n00:00:24.480 but before we get on any flights let me\n00:00:26.480 show you what's being done here in\n00:00:27.840 london\n00:00:29.199 living walls are being implemented\n00:00:30.800 across the capital city to help clean\n00:00:32.719 the air this is because toxic pollution\n00:00:35.040 can be incredibly high within the city\n00:00:36.559 centre\n00:00:37.600 green walls have the capability to\n00:00:39.200 absorb these harmful chemicals and in\n00:00:41.280 exchange they

release pure oxygen they can even be placed indoors to increase the internal oxygen levels it is likely that green walls will be an integral part of our cities in the future as it is predicted that 75 of people will be living in cities by this will be 3 billion more people moving into urban districts therefore we have to create the right infrastructure to cater for this increased demand over in china 400 000 people are dying every year prematurely due to the high pollution levels these levels can exceed 50 times what the world health organization deems to be safe the source of the pollution is what should be sorted out first however green architecture can play an important role in providing clean air to the asian cities they are planning to develop entire forest cities in the louisiana region which can absorb 10 000 tons of co2 annually and produce 900 tons of oxygen this is all being designed by the italian architect stefano beret who has already designed and built vertical forest over in milan these buildings are not only doing good for our physical health but also have a positive effect on our psychological well-being i traveled to barcelona as i was told they were creating green architecture to improve the psychological well-being of its citizens so i wanted to see if it actually made me feel any different the demolition of an old building in the city's less court district left an ugly dividing wall facing towards the streets this left a particularly negative impact on the city's landscape due to its high visibility the architect capela garcia came up with a solution to create a vertical garden which wraps around and attaches to the sides of the existing building the vertical garden softens the urban landscape and provides passersby with a connection to nature by strengthening this bond people have with nature it will encourage them to be more environmentally conscious of their own habits there is interior access to the vertical garden which allows maintenance to be done from the inside however the wall has a network of connected tubes so the plants are automatically fed with programmed doses of water and fertilizer it has created a new ecosystem it's even encouraging biodiversity it's provided a natural habitat to a variety of birds whose natural environment was once destroyed by urban development the bunker catalana building was the first green building to be built in barcelona the plants provide shade from the heat of the strong sun which dramatically reduces the air conditioning requirements inside of the building the plants wrap the entire building on each level providing natural shade to the offices behind it it can also lower the external temperatures by up to seven degrees which can be extremely important in large cities that experience the heat island effect one city

that experiences this effect in\n00:03:17.760 particularly is singapore which sits\n00:03:19.840 right by the equator\n00:03:21.680 this is a city that's taking green\n00:03:23.280 architecture to a whole new level the\n00:03:25.599 city has one of the highest population\n00:03:27.280 densities in the world however before\n00:03:29.200 the 19th century it was covered in lush\n00:03:31.120 rainforest and the only inhabitants were\n00:03:33.360 animals who had perfectly adapted to the\n00:03:35.120 hot humid climate\n00:03:38.239 in the 19th century mass deforestation\n00:03:40.480 occurred and trees were replaced with\n00:03:42.319 concrete leading to the average\n00:03:44.159 temperature of the region to rise\n00:03:45.680 dramatically however in recent years\n00:03:48.000 there has been a resurgence of greenery\n00:03:49.599 within the city\n00:03:50.879 this has been an attempt to reduce the\n00:03:52.400 heat island effect within the city\n00:03:53.840 centre which is incredibly important\n00:03:55.680 with the overall climate getting warmer\n00:03:58.080 as we experience singapore is incredibly\n00:04:00.319 hot however the use of greenery and\n00:04:02.799 water features at the street level help\n00:04:04.799 keep us cool\n00:04:06.879 this greenery has been transferred into\n00:04:08.560 the architectural designs of the\n00:04:09.920 buildings\n00:04:11.599 the park royal hotel on pickering was\n00:04:13.840 designed as a hotel and garden the\n00:04:16.000 project has won numerous awards for\n00:04:17.759 sustainable and green efforts including\n00:04:19.759 the bca green mark platinum which is\n00:04:21.918 singapore's highest green rating the\n00:04:24.160 building reinforces singapore's tropical\n00:04:26.320 image and enhances the quality of life\n00:04:28.240 of its guests\n00:04:29.520 it does this by providing spaces where\n00:04:31.440 the guests can completely immerse\n00:04:32.960 themselves within nature\n00:04:34.800 it can also benefit those who are simply\n00:04:36.720 walking by and admiring the building\n00:04:40.080 even the concrete has been shaped to\n00:04:41.680 resemble natural forms the designers at\n00:04:44.080 woha refer to this as topographical\n00:04:46.000 architecture the stratified undulating\n00:04:48.240 layers of precast concrete wrap around\n00:04:50.400 the entire building and resemble the\n00:04:52.240 structure of the bedrock\n00:04:54.160 this shows that nature can not only be\n00:04:55.840 used for practicality and efficiency but\n00:04:57.840 can also be used as a design inspiration\n00:05:01.759 not far from this building is the oasia\n00:05:03.680 hotel which is a building entirely\n00:05:05.680 wrapped in a red skin\n00:05:07.440 this allows plants to grow in\n00:05:09.120 the facade in total the building hosts\n00:05:11.520 54 species of plants and trees which\n00:05:14.000 help improve the biodiversity within the\n00:05:16.000 city\n00:05:16.560 [Music]\n00:05:17.759 the 190 metre tall building has large\n00:05:20.320 sections cut out which break up the\n00:05:22.080 facade and allow cross-ventilation into\n00:05:24.320 the building\n00:05:26.639 these garden spaces act as mini oasis in\n00:05:29.840 the center of the busy business district\n00:05:33.759 overall the green facade totals over 25\n00:05:36.880 000 square meters\n00:05:38.800 and the plot of land the building sits\n00:05:40.720 on is only 2 500 square meters\n00:05:44.240 this means the building achieves an\n00:05:45.680 overall greenery replacement of more\n00:05:47.280 than 10 times the site area this will\n00:05:49.680 help address the huge loss of green\n00:05:51.280 spaces within the urban city center\n00:05:54.880 like other living facades it works with\n00:05:56.639 an enormous lung which generates oxygen\n00:05:59.039 and absorbs co2\n00:06:01.520 it is also able to filter out dust fumes\n00:06:04.479 and pollution from the air\n00:06:07.120 the most famous tourist

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assignment 1 and dq4. Use the other attachments to inform your response to the
question and ensure you cite the attachments plus one other scholarly source in your
answer\nPart 1: With projections of the global population reaching ten billion by 2050,
and 75% estimated to live in urban centers and cities, our built environment is
becoming ever-more critical in creating infrastructure for affordable housing,
workspace, leisure, commerce, and life. And with buildings accounting for 44% of
global carbon output, this is an opportunity to redesign the built environment on a
global scale. Research some closed-loop systems for urban architecture. Choose one
example and explain the \u2018controls/converter\u2019, \u2018feedback loops\u2019,
and technology or mitigating system that convert a building to sustainability (or
better yet, a carbon-negative sink). How could this type of construction or design be
incorporated into standards in Western building and construction? Does regulation, tax
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resources available within the system at any given time. These could be tangible elements like water in a reservoir or abstract quantities such as carbon or even a population count in an ecological study. Stocks are foundational for monitoring resource levels and serve as a baseline for measuring changes over time (Reuter 2013).

Flows describe the movement of resources between stocks or from external sources into the system. This includes inputs and outputs measured over specific time intervals such as liters of water per hour or tons of carbon per year. Understanding flows is critical for assessing how resources are utilized and replenished within the system providing insights into sustainability and efficiency (Reuter 2013).

Converters/constants are parameters within the model that affect flows or stocks but remain unchanged regardless of system dynamics. These could include growth rate constants conversion efficiencies or fixed loss rates which are essential for stabilizing the model and making accurate predictions (Reuter 2013).

Information flows represent the non-material connections that influence system components by altering flows or converters based on the state of stocks or other variables. This aspect of systems dynamics is crucial for modeling feedback mechanisms and adaptive behaviors within the system allowing for a more nuanced understanding of how changes in one part of the system can ripple through to others (Reuter 2013).

By integrating these components into a systems dynamics model it is possible to construct a comprehensive view of how resources are interlinked and governed by various dynamic factors. This holistic approach is vital for predicting future system states under different scenarios and for making informed decisions about resource management and conservation.

What inputs might be incorporated into a model of flow-limited resources? How is this different from stock-limited resources? In resource management two distinct modeling approaches are used to predict and understand resource availability and sustainability: flow-limited and stock-limited models.

Flow-limited models focus on the dynamics of resource renewal and consumption. These models consider key inputs like the rate at which a resource regenerates whether naturally or through human efforts. They also analyze the consumption rate to see how quickly the resource is being used by various entities or processes. Additionally factors like environmental conditions regulatory policies and technological changes play significant roles in influencing resource availability and flow. This model is dynamic adapting to changes in usage patterns and replenishment strategies providing a flexible framework for forecasting future resource statuses (Reuter 2013).

In contrast stock-limited models are concerned with the finite quantities of resources available. They focus on the absolute amount of the resource that exists or can be accessed such as fossil fuels or minerals. These models consider extraction or harvest rates detailing how quickly the resource is depleted over time. They also evaluate the resource's regeneration capabilities whether it can be naturally replenished or artificially sustained over long periods. This approach emphasizes the depletion of a fixed stock highlighting the limits of availability and the critical need for conservation and efficient use (Reuter 2013).

The main difference between these two models lies in their focus and application. Flow-limited models are dynamic reflecting continuous changes in resource flows and the effects of various influencing factors. They are particularly useful when resources can be renewed or are affected by external conditions. On the other hand stock-limited models deal with resources that have fixed availability concentrating on managing finite supplies and preventing exhaustion. Understanding these differences is crucial for policymakers businesses and conservationists. It helps in developing effective strategies for resource management

ensuring sustainability and tackling the challenges posed by limited natural resources (Fisher 2020).

Provide an example of the systems dynamics of:

- A stock-limited resource (such as cobalt)
- A flow-limited resource (such as rabbits)

Describe what and how you would measure the inputs outputs and feedback loops (in-flow out-flow connectors or dependencies stocks and sources or sinks) in each example. Keep it simple (i.e. bamboo production for chairs). You don't have to do the mathematical calculations just describe the systems process. (If you want to take it further you can use Stella Online Modeling linked above).

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projects in the UK is 100% recyclable and requires minimal energy for transportation and installation due to being only 1% of the way to plus this dramatically reduces the need for large supporting structures – finally the addition of a roof garden for extra insulation the solar panels for the generation of energy make this building an excellent example of environmentally conscious architecture. Roof Gardens aren't typically the main design feature of a building over this next building makes the sky forest the core design feature the capita green building in Singapore was designed around a simple concept with major benefits the building is crowned with a red flower light sculpture the pencils capture and guide the wind down is the building's cooling board which stems its way right down the core of the building this providing listening to all 40 stories a vastly reduced rate of energy consumption the era tuned in 42 meters high troubles at a high speed and is cooler and fresher due to the sky forest which has been planted the building does 55% of the exterior covered with lush foliage this not only reduces the solar heat gain also as a positive effects on the users within by promoting the sense of Biophilia this building the shown that using nature as a design inspiration is one of the best ways being combat climate change this next design can be best introduced by the mayor of London. loon burger company have made a large after image using that ecological footprint in their buildings in total they have saved a massive 95 million dollars in operating costs have also drastically improved employees productivity this goes to show that smart buildings aren't just benefiting the planet they are also benefiting her economy and well-being to this building achieves such high sustainable credentials to use the new solutions it has for ventilation lighting power and water 4,000 integrated ceiling panels have been included with the petal leaf design the panels combine heating cooling lighting and acoustic functions and use 40% less energy than a typical office lighting system the building takes over 3.2 acres and yet can still be naturally ventilated usually buildings of the scale require high energy intensive mechanical ventilation systems over this building have the ability to breathe naturally the bronze fins and the Bussard hold vents which can open and close pulling air through the office space into the atrium and out of the roof the water conservation system saved 25 million litres of water each year enough to fill 10 Olympic swimming pools the building also has its own on-site combined heat and power system therefore the waste heat generated from creating energy be reused for heating and cooling the building this building the show and the design can be improved in almost every aspect to help save

our environment but in order to have a big enough effect we need every new building to be designed in such a thoughtful way finally the one you've all been waiting for the world's smartest building it is called the edge and it's located in Amsterdam the buildings orientation is based on the path of the Sun the HU invades the building in northern daylight while the solar panels on the southern Bussard collect the energy from the Sun these solar panels are then able to power all smartphones laptops and electric cars I find it amazing how your car can be powered while you're at work due to the solar panels on the side of your office building once inside the phone up that all employees have takes the forefront wherever you go the app knows your preferences for light and temperature its weeks the environment you step into according to 20 centimeters of accuracy this app tells the building system when rooms are unoccupied which means when the zero occupancy is next to zero energy use the building is learning everyday and because it is connected to the internet it is future proofed so they can add new sensors as technology advances in the future finally the building stays warm by pumping down warm water in the summer months almost 400 feet into the aquifer below it sits it insulated into the winter when it is sucked back out for heating our planning to build a lot more buildings like these and the next one will be smarter and the one after that will be smarter as well and we won't stop until all cities in the world are filled with buildings that are intelligent and that are not using any energy anymore

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in a liquid state a characteristic of genuine extra virgin olive oil (EVOO). Intrigued by this I decided to investigate the claim myself focusing on my preferred brand Farchioni and investigating through the lens of authority and knowledge one might expect of Farchioni's Chief Sustainability Officer. Given the high demand and available agricultural resources are the current levels of EVOO production sustainable?

Background of EVOO Production

Italy stands out as a leading producer of olive oil reflecting a rich blend of tradition and modernity in its agricultural practices. This duality is embodied in every bottle of olive oil such as my 1-liter bottle of extra virgin olive oil (EVOO) from Farchioni which I recently placed in the fridge to chill. As I waited to observe the results of my experiment I reflected on Farchioni's claims of harmoniously combining age-old techniques with contemporary methods to meet today's sustainability standards (Sustainability n.d.). This integration helps maintain the ecological balance and ensures the survival of traditional practices cherished across generations.

Farchioni a prominent figure in the olive oil market serves as a prime example of the successful integration of tradition and modernity in EVOO production. Their production process combines advanced machinery to enhance efficiency and reduce waste with traditional methods like hand-picking and first-cold-pressing (Sustainability n.d.). These traditional methods are crucial for maintaining the distinct quality and authenticity of their EVOO setting a benchmark for sustainable production in the industry. Farchioni's approach reflects a broader commitment across Italy to innovate while preserving the integrity of the olive oil heritage.

As the olive oil industry evolves regions like Umbria where Farchioni's farms are located encounter their share of challenges. These include high operational costs and an aging workforce which necessitate further technological advancements. Modern tools like open-source spectrophotometers and AI are now being used to enhance traceability and ensure the purity of EVOO (Bayreuth n.d.; Violino et al. 2020). These technologies strengthen the 'Made in Italy' label a crucial asset in the global marketplace and drive significant environmental improvements. For instance optimizing distribution and updating packaging materials are proposed to reduce the carbon footprint of EVOO production (Pisanelli et al. 2023). This paints a picture of a future where tradition and innovation continue to merge ensuring the sustainability and authenticity of Italian olive oil on a global scale.

Sustainability Metrics and Indicator Analysis

To comprehensively assess the sustainability of extra virgin olive oil (EVOO) production it is essential to consider a range of indicators that align with the seven principles of sustainability: efficiency substitution economic environmental social sustainability inter-generational equity and institutional sustainability. These principles can be measured using specific metrics such as material and energy intensity water consumption emission of toxic substances human health implications fair labor practices and the overall impact on the community. These metrics help in evaluating the breadth and depth of sustainability practices within the EVOO production process and are critical for making informed decisions aimed at improving sustainability outcomes over time (Maesano et al. 2021; Safeie-Noghlbari et al. 2024).

In the context of material intensity EVOO production demands significant resources particularly in packaging and equipment. Commonly used for oil bottling glass is energy-intensive to produce and contributes to higher CO2 emissions. This highlights the need for more sustainable packaging solutions such as recycled or lighter glass which could decrease material intensity and environmental impact (Maesano et al. 2021; Rinaldi et al. 2014; Salomone & Ioppolo 2012). Similarly the metals used in processing equipment also require

consideration particularly in terms of the energy and resources consumed during their manufacture and eventual recycling or disposal (Hansen 2022; Pisanelli et al. 2023; Salomone & Ioppolo 2012).

Energy and water consumption are equally critical metrics. The operation of irrigation systems and processing facilities consumes substantial energy which can be mitigated by integrating renewable energy sources such as solar or wind power to reduce the carbon footprint of production processes (Allen et al. 1998; Hansen 2022; Rinaldi et al. 2014; Salomone & Ioppolo 2012).

Concerning water consumption olive cultivation particularly in drier regions necessitates significant water usage. Employing sustainable water management practices such as adopting drip irrigation systems can dramatically decrease water consumption preserving vital water resources. Additionally using pesticides and fertilizers in olive farming introduces toxic emissions and pollutants that can affect soil and water quality. Implementing organic farming practices and optimizing transportation and logistics can help minimize these environmental impacts (Ivic et al. 2021; Maesano et al. 2021).

Beyond environmental considerations the human dimension of sustainability is pivotal. Protecting human health and safety in EV00 production involves minimizing workers' exposure to harmful chemicals ensuring proper safety training and providing adequate protective equipment (Connor & Fereres 2010; Ncube et al. 2022). Furthermore adhering to labor laws and embracing fair trade practices are essential to guarantee fair wages and good working conditions for all employees. Finally the broader community impact of companies like Farchioni should be recognized as they often support local initiatives in education and healthcare contributing positively to the social fabric of their operating regions (Ncube et al. 2022). These efforts enhance community well-being and bolster the social sustainability of the business practices. By addressing these various sustainability indicators companies can comply with current standards and set new benchmarks for responsible production in the industry.

Supply Chain Model

The supply chain for EV00 includes several stages: olive cultivation and harvesting processing and extraction packaging and storage and distribution and retail. Each stage presents unique sustainability challenges and opportunities. Improving energy efficiency in processing and adopting sustainable packaging materials can significantly enhance the product's overall sustainability (Maesano et al. 2021).

Information Gaps and Inferences

There are notable gaps in available data particularly regarding comprehensive lifecycle assessments for EV00 production. Data on the environmental impacts of material extraction and processing is limited. However comparative analysis with similar agricultural products such as wine or almond production provides insights into potential sustainability impacts. Studies on these products show that organic farming practices and renewable energy usage can significantly reduce environmental footprints (Gennaro & Nardone 2014; Maesano et al. 2021).

Role as Chief Sustainability Officer

As Farchioni's Chief Sustainability Officer several measures can be prioritized to enhance sustainability in the company's operations. These include enhancing energy efficiency and renewable energy use implementing sustainable water management practices improving waste management and reducing emissions and ensuring fair wages and safe working conditions. Progress can be measured by setting specific measurable goals conducting regular sustainability audits publicly reporting on sustainability performance engaging stakeholders and maintaining open communication about progress and challenges (Allen et al. 1998; Maesano et al. 2021; Safeie-Noghlbari et al. 2024; Salomone & Ioppolo 2012).

Conclusion

Reflecting on the initial question of whether the levels of EV00 production are sustainable the answer is complex.

Farchioni's EV00 did not solidify in the refrigerator maintaining its same viscosity and overall physical properties indicating its authenticity (Bayreuth n.d.). However the sustainability of EV00 production can be significantly improved through targeted measures that address material and energy use water consumption emissions and social impacts. Cooperative resource allocation systems emphasizing community involvement and fair practices are essential for achieving long-term sustainability in the olive oil industry. By adopting these measures companies can contribute to a more sustainable future while maintaining the cultural and economic significance of EV00 production in Italy.

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the\00:01:37.200 dish is loaded were clean to begin with\00:01:39.150 the dishwasher would still run for the\00:01:40.920 prescribed time further if you loaded\00:01:43.619 the dishwasher with ten plates full of\00:01:45.630 cake the set time might not be enough to\00:01:48.119 clean them another common example of\00:01:51.689 open-loop control is a sprinkler system\00:01:54.000 for your lawn in this control system the\00:01:59.189 system output is the moisture content of\00:02:01.710 the soil again the user sets the timer\00:02:05.939 which controls the amount of time to run\00:02:08.128 the sprinklers and while the sprinklers\00:02:10.139 are running the plant which is the grass\00:02:11.910 in this case is being\00:02:13.230 watered again an open-loop sprinkler\00:02:16.379 system would still run even if it was\00:02:18.180 raining outside for a more complicated\00:02:20.549 example imagine trying to obtain a\00:02:23.129 constant speed in your car without the\00:02:25.530 benefit of the built-in automatic cruise\00:02:27.390 control to do this you went to Rod\00:02:30.330 between the front of your seat and the\00:02:31.860 gas pedal to depress it halfway down the\00:02:35.190 output of the control system is the\00:02:36.660 speed of the car and the input is the\00:02:39.660 position of the gas pedal again the car\00:02:42.329 itself is the plant the car begins to\00:02:45.540 accelerate down a flat road until the\00:02:47.579 force applied to the system is balanced\00:02:49.620 by the force of friction at this point\00:02:51.840 the car stops accelerating and maintains\00:02:53.609 a constant speed but what happens when\00:02:56.099 the car encounters a hill or a Valley\00:02:57.900 without varying the input that is\00:03:00.629 adjusting the gas pedal the car will\00:03:02.760 slow down or speed up and the desired\00:03:04.560 constant speed will not be maintained\00:03:06.599 this is the primary drawback to\00:03:08.609 open-loop control the input to the\00:03:10.560 system has no way to compensate for\00:03:12.420 variations in the system now to account\00:03:15.390 for these changes you must vary the\00:03:17.010 input to your system with respect to the\00:03:18.810 output and this type of control system\00:03:20.880 is called a closed loop control system\00:03:22.260 now in addition to calling a closed loop\00:03:26.099 control this can also be referred to as\00:03:27.840 feedback control negative feedback\00:03:30.269 control or automatic control for the\00:03:32.340 time being we'll use these terms\00:03:33.599 interchangeably although there are\00:03:35.190 slight variations between some of them\00:03:37.019 that we won't address in this lecture in\00:03:39.150 closed loop control you measure the\00:03:40.680 output of the system with a sensor and\00:03:42.329 compare the result against a reference\00:03:44.579 signal often this is referred to as the\00:03:47.250 desired state or the commanded state an\00:03:49.139 error term is generated and then fed\00:03:51.720 through a controller where the error is\00:03:53.700 converted into a system input value when\00:03:56.849 drawn in block diagram form it's easy to\00:03:58.859 see why this is referred to as a control\00:04:00.629 loop the negative part of the negative\00:04:03.299 feedback control term is based on the\00:04:05.040 comparator juncture where the feedback\00:04:07.260 is subtracted so how does feedback\00:04:10.230 control work in practice well let's take\00:04:12.359 the case of the dishwasher\00:04:13.650 there could be a sensor that measures\00:04:15.930 the cleanliness of the plates the\00:04:18.149 reference signal would be some sort of\00:04:19.769 desired cleanliness level that would be\00:04:21.959 set either by the manufacturer or by the\00:04:24.030 user\00:04:26.470 this desired cleanliness

level would be 28.750 compared to the measured level an error 32.920
 term would be generated which would be 35.260 fed through a controller which
 would 37.090 monitor when to shut off the dishwasher 38.920 a sprinkler
 system could also benefit 42.790 from closed-loop control the
 sensor 45.400 could be a device planted in the soil 47.770 that measures
 the moisture content of 49.960 the plant remember that in this case
 the 52.420 plant is both the grass and the soil the 56.350 reference
 signal would be a desired soil 58.990 moisture content and again the
 error 05:02.560 signal would be generated which would 05:04.690 then be fed
 through a controller and the 05:07.180 controller would adjust the amount
 of 05:09.220 time that the sprinklers ran the 05:11.980 sprinklers would then
 run until the 05:13.690 moisture level reached a specified value 05:16.120 and
 then they would be shut off 05:20.930 for the car with cruise
 control 05:23.320 closed-loop control would work something 05:25.400 like
 this 05:27.040 the sensor is a speedometer which 05:30.229 measures the speed
 of the car the 05:32.870 reference speed would be the speed that 05:34.789 the
 car was going when the cruise 05:36.830 control was set now assume that the
 car 05:41.150 starts in a steady-state position on 05:43.220 flat road and
 what I mean by that is 05:45.800 that the speed is constant at your 05:47.479
 desired speed and also that the gas 05:49.820 pedal is depressed the amount needed
 to 05:52.550 generate that speed for this example 05:55.400 let's say the
 desired speed is a hundred 05:57.470 miles per hour 05:58.400 therefore the
 speedometer would also 06:00.139 read a hundred miles per hour and
 since 06:02.479 the measured speed exactly matches the 06:04.250 reference be
 the error term is zero the 06:07.190 gas pedal would stay exactly where it
 is 06:08.690 once the car encounters the hill the 06:11.150 speed starts to
 slow 06:12.440 now the reference speed is greater than 06:14.180 the measured
 speed and the error term 06:15.800 becomes positive which signals
 the 06:17.510 controller to speed up if the car 06:20.060 encounters are
 downhill the speed will 06:21.560 increase now the reference speed is
 less 06:23.990 than the measured speed and the error 06:25.550 term will be
 negative the beauty of the 06:27.979 feedback control system is that it
 is 06:29.389 capable of reacting to changes to the 06:31.190 plant
 automatically by constantly 06:32.990 driving the error term to zero I want
 to 06:36.169 leave you with one more thought 06:37.250 regarding closed-loop
 control if we take 06:40.550 a block diagram and assign letters that 06:43.190
 abstractly represent the various parts 06:45.590 of a control system we can gain
 new 06:47.750 insight into how feedback control is 06:50.260 manipulating a
 system for example if we 06:53.570 label the reference signal V and we
 call 06:56.389 the controller some abstract process D 06:58.699 through the
 plant G which produces an 07:00.979 output we'll call Y which can be
 fed 07:03.110 back through the sensor H to generate an 07:05.060 error term e
 we can then reduce this 07:08.030 block diagram even further for
 example 07:11.570 we can multiply D and G to combine into 07:14.090 a single
 block to reduce further however 07:17.060 takes a small amount of algebra
 the 07:19.400 error signal is the reference signal V 07:21.889 minus the
 output Y times the sensor 07:24.590 process H the output Y is the error
 term 07:27.800 times D times G now solve this equation 07:31.700 for e which
 will give you Y over DG 07:34.790 now you can set both equations equal

to each other and through a few more algebraic steps you can solve for the variable Y with respect to V and since Y is the output and V is the input the rest of that equation is what we refer to as a transfer function of the system in this case the transfer function is $\frac{G}{1 + DGH}$ and for those who are paying attention you'll notice that I forgot to write the V at the end of that equation there we can now rewrite this back in block diagram form these two block diagram representations are equivalent of each other now doesn't this new process look a lot like an open-loop control system only with a modified plant the feedback path has altered the original plant to be something new and furthermore the open-loop behavior of this new plant has the exact characteristics we wanted from the original plant namely that it follows our input now here's something to ponder until the next video what are the limitations of feedback control in other words can we make any plant G behave like anything we choose just by adding a feedback control system which is made up of a controller D and a sensor H one other thing do you think in our car example from up above by using feedback control we can turn a Pinto into a Ferrari just by applying more gas we'll discuss that in a future video

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transcript discussing smart buildings\source\3011. \n\n### Closed-Loop System: The Edge Building\n\n**Controls/Converter**: The Edge employs a variety of advanced technologies that act as controls and converters to enhance its sustainability. Key technologies include:\n- **Smart Lighting and Energy Systems**: Utilizing an array of solar panels and LED lighting that adjust based on occupancy and natural light availability.\n- **Thermal Energy Storage**: A system that stores excess thermal energy in an aquifer for later use, effectively balancing the building's temperature throughout the year.\n- **Feedback Loops**: The Edge utilizes a sophisticated Building Management System (BMS) integrated with a mobile app that collects real-time data from various sensors throughout the building. This data about light, occupancy, and temperature is fed back into the system, which automatically adjusts the building's operations to optimize energy usage and comfort.\n- **Technology/Mitigating System**: The building incorporates high-efficiency solar panels on its facade and roof, designed to meet all its power requirements sustainably. Moreover, it features a rainwater harvesting system to reduce water usage, and the use of high-insulation materials minimizes energy loss.\n\n### Integration into Western Building Standards\n\nTo incorporate such designs into Western building standards, several strategies could be considered:\n1. **Regulation and Building Codes**: Updating building codes to require or strongly incentivize the inclusion of renewable energy sources, high-efficiency insulation, and water recycling systems in new constructions.\n2. **Tax Credits and Incentives**: Implementing tax rebates or credits for buildings that achieve certain sustainability benchmarks such as LEED or BREEAM certification standards, which could encourage developers to adopt closed-loop systems.\n3. **Carbon Cap and Trade**: Introducing or expanding carbon trading schemes that include credits for building projects that reduce carbon emissions through innovative architectural designs could spur more investments in sustainable building technologies.\n\n### Scholarly Perspective\n\nAccording to a study by Charlot-Valdieu and Outrequin (2001), the integration of sustainable development criteria into urban planning and building regulations can significantly decrease the environmental impact of new buildings. They suggest that such integration not only improves energy efficiency but also enhances the quality of life for city dwellers by reducing urban heat islands and improving air quality.\n\nScholarly Source\3011. \n\nIn conclusion, by incorporating closed-loop systems like those used in The Edge, Western building and construction standards can significantly advance towards sustainability. This requires a coordinated approach involving updated regulations, financial incentives, and a broad commitment to rethinking how urban environments are designed and constructed."]}, "status": "finished_successfully", "end_turn": true, "weight": 1.0, "metadata": {"citations": [{"start_ix": 375, "end_ix": 386, "citation_format_type": "tether Og", "metadata": {"type": "file", "name": "tactiq-free-transcript-fuKNaGhZE2Y.txt", "id": "file-MMSvR025ltQjDC2qR9HJOSK8", "source": "my_files", "text": "# tactiq.io free youtube transcript\n# Smart Buildings Saving the World | Visiting Sustainable Architecture\n# https://www.youtube.com/watch/fuKNaGhZE2Y\n\n00:00:00.000 make sure you stick around to the end\n00:00:01.620 where I will reveal the world's smartest\n00:00:03.689 building when people ask me why I study\n00:00:06.330 architecture I show them this graph\n00:00:08.389 buildings are responsible for the most\n00:00:10.320 amount of carbon emissions out of all\n00:00:11.849 sectors but this doesn't have to be as\n00:00:14.040 we have the technology to make carbon\n00:00:15.929 neutral buildings

we start in Barcelona 18.630 where a building which looks like it's 20.400 being wrapped in bubble wrap is actually 22.260 a prime example of how we can use 23.699 technology to make large buildings 25.289 respect our environment the technology 27.900 used on this building keeps the inside 29.519 cool 30.269 therefore dramatically reduces the need 32.130 for air conditioning air conditioning in 34.290 hot countries such as Spain can make up 36.120 for 40% of the total building energy 38.070 consumption just to cool the inside of a 40.530 building that is far too much so how 43.500 does the technology on this building 44.850 work using sensors the building detects 47.460 from the sun is shining on the facade 48.960 and pumps nitrogen into the ETFE 51.180 cushions which causes them to expand 53.100 this creates a block between the heat of 55.170 the Sun and the cool building interior 57.090 in two different ways firstly on the 59.160 south east facade the cushions create a 01:01.050 positive reverse design which creates a 01:03.120 shared effect inside secondly on the 01:05.700 south west facade along the cushions 01:07.710 insulate the building as the nitrogen 01:09.299 acts as a cloud like solar filter this 01:11.939 combination of design stops 01:13.380 approximately 114 tons of co2 entering 01:16.380 our atmosphere per year this is 01:18.180 equivalent to planting over 5,000 trees 01:20.130 every single year we also must use 01:22.799 sustainable materials ET Fe is the 01:25.350 polymer that was also used for Eden 01:26.939 projects in the UK is 100% recyclable 01:29.670 and requires minimal energy for 01:31.380 transportation and installation due to 01:33.540 being only 1% of the way to plus this 01:36.000 dramatically reduces the need for large 01:37.710 supporting structures - finally the 01:40.829 addition of a roof garden for extra 01:42.329 insulation the solar panels for the 01:44.070 generation of energy make this building 01:45.990 excellent example of environmentally 01:47.850 conscious architecture 01:49.640 Roof Gardens aren't typically the main 01:51.990 design feature of a building over this 01:54.180 next building makes the sky forest the 01:55.950 core design feature the capita green 01:58.740 building in Singapore was designed 02:00.600 around a simple concept with major 02:02.159 benefits the building is crowned with a 02:04.229 red flower light sculpture the pencils 02:06.630 capture and guide the wind down is the 02:08.310 building's cooling board which stems its 02:10.348 way right down the core of the building 02:11.640 this providing 02:13.710 listening to all 40 stories a vastly 02:16.260 reduced rate of energy consumption the 02:18.120 era tuned in 42 meters high troubles at 02:21.150 a high speed and is cooler and fresher 02:23.010 due to the sky forest which has been 02:24.780 planted the building does 55% of the 02:27.780 exterior covered with lush foliage this 02:30.060 not only reduces the solar heat gain 02:31.740 also as a positive effects on the users 02:33.900 within by promoting the sense of 02:35.520 Biophilia this building the shown that 02:38.460 using nature as a design inspiration is 02:40.830 one of the best ways being combat 02:42.270 climate change this next design can be 02:45.300 best introduced by the mayor of London 02:52.490 loon burger company have made a large 02:54.960 after image using that ecological 02:56.340 footprint in their buildings in total 02:58.920 they have saved a massive 95 million 03:00.750 dollars in

operating costs have also\n00:03:02.610 drastically improved employees\n00:03:04.050 productivity this goes to show that\n00:03:06.150 smart buildings aren't just benefiting\n00:03:07.650 the planet they are also benefiting her\n00:03:09.540 economy and well-being to this building\n00:03:12.270 achieves such high sustainable\n00:03:13.560 credentials to use the new solutions it\n00:03:15.450 has for ventilation lighting power and\n00:03:17.580 water 4,000 integrated ceiling panels\n00:03:20.940 have been included with the petal leaf\n00:03:22.590 design the panels combine heating\n00:03:25.110 cooling lighting and acoustic functions\n00:03:27.240 and use 40% less energy than a typical\n00:03:29.430 office lighting system the building\n00:03:32.040 takes over 3.2 acres and yet can still\n00:03:34.440 be naturally ventilated usually\n00:03:36.480 buildings of the scale require high\n00:03:37.950 energy intensive mechanical ventilation\n00:03:39.750 systems over this building have the\n00:03:41.880 ability to breathe naturally the bronze\n00:03:44.340 fins and the Bussard hold vents which\n00:03:46.290 can open and close pulling air through\n00:03:47.970 the office space into the atrium and out\n00:03:49.950 of the roof the water conservation\n00:03:52.140 system saved 25 million litres of water\n00:03:54.630 each year enough to fill 10 Olympic\n00:03:57.120 swimming pools the building also has its\n00:03:59.460 own on-site combined heat and power\n00:04:00.930 system therefore the waste heat\n00:04:03.060 generated from creating energy be reused\n00:04:05.580 for heating and cooling the building\n00:04:06.920 this building the show and the design\n00:04:09.210 can be improved in almost every aspect\n00:04:10.650 to help save our environment but in\n00:04:12.960 order to have a big enough effect we\n00:04:14.760 need every new building to be designed\n00:04:16.380 in such a thoughtful way finally the one\n00:04:19.829 you've all been waiting for the world's\n00:04:21.720 smartest building\n00:04:23.639 it is called the edge and it's located\n00:04:25.830 in Amsterdam the buildings orientation\n00:04:28.229 is based on the path of the Sun the HU\n00:04:30.479 invades the building in northern\n00:04:31.800 daylight while the solar panels on the\n00:04:33.810 southern Bussard collects the energy\n00:04:35.159 from the Sun these solar panels are then\n00:04:37.560 able to power all smartphones laptops\n00:04:39.509 and electric cars I find it amazing how\n00:04:43.110 your car can be powered while you're at\n00:04:44.520 work due to the solar panels on the side\n00:04:46.439 of your office building once inside the\n00:04:49.409 phone up that all employees have takes\n00:04:51.029 the forefront wherever you go the app\n00:04:52.889 knows your preferences for light and\n00:04:54.270 temperature its weeks the environment\n00:04:56.099 you step into according to 20\n00:04:57.569 centimeters of accuracy this app tells\n00:05:00.539 the building system when rooms are\n00:05:01.889 unoccupied which means when the zero\n00:05:03.779 occupancy is next to zero energy use the\n00:05:07.289 building is learning everyday and\n00:05:08.789 because it is connected to the internet\n00:05:10.229 it is future proofed so they can add new\n00:05:12.240 sensors as technology advances in the\n00:05:13.919 future finally the building stays warm\n00:05:16.469 by pumping down warm water in the summer\n00:05:18.330 months almost 400 feet into the aquifer\n00:05:20.460 below it sits it insulated into the\n00:05:23.279 winter when it is sucked back out for\n00:05:25.169 heating our planning to build a lot more\n00:05:28.860 buildings like these and the next one\n00:05:30.659 will be smarter and the one after that\n00:05:32.339 will be smarter as well and we won't\n00:05:34.740 stop until all cities in the world are\n00:05:37.199 filled with buildings that are\n00:05:38.250

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feature the capita green building in Singapore was designed around a simple concept with major benefits the building is crowned with a red flower light sculpture the pencils capture and guide the wind down is the building's cooling board which stems its way right down the core of the building this providing listening to all 40 stories a vastly reduced rate of energy consumption the era tuned in 42 meters high troubles at a high speed and is cooler and fresher due to the sky forest which has been planted the building does 55% of the exterior covered with lush foliage this not only reduces the solar heat gain also as a positive effects on the users within by promoting the sense of Biophilia this building the shown that using nature as a design inspiration is one of the best ways being combat climate change this next design can be best introduced by the mayor of London loon burger company have made a large after image using that ecological footprint in their buildings in total they have saved a massive 95 million dollars in operating costs have also drastically improved employees productivity this goes to show that smart buildings aren't just benefiting the planet they are also benefiting her economy and well-being to this building achieves such high sustainable credentials to use the new solutions it has for ventilation lighting power and water 4,000 integrated ceiling panels have been included with the petal leaf design the panels combine heating cooling lighting and acoustic functions and use 40% less energy than a typical office lighting system the building takes over 3.2 acres and yet can still be naturally ventilated usually buildings of the scale require high energy intensive mechanical ventilation systems over this building have the ability to breathe naturally the bronze fins and the Bussard hold vents which can open and close pulling air through the office space into the atrium and out of the roof the water conservation system saved 25 million litres of water each year enough to fill 10 Olympic swimming pools the building also has its own on-site combined heat and power system therefore the waste heat generated from creating energy be reused for heating and cooling the building this building the show and the design can be improved in almost every aspect to help save our environment but in order to have a big enough effect we need every new building to be designed in such a thoughtful way finally the one you've all been waiting for the world's smartest building it is called the edge and it's located in Amsterdam the buildings orientation is based on the path of the Sun the HU invades the building in northern daylight while the solar panels on the southern Bussard collects the energy from the Sun these solar panels are then able to power all smartphones laptops and electric

cars I find it amazing how\n00:04:43.110 your car can be powered while you're
at\n00:04:44.520 work due to the solar panels on the side\n00:04:46.439 of your office
building once inside the\n00:04:49.409 phone up that all employees have
takes\n00:04:51.029 the forefront wherever you go the app\n00:04:52.889 knows your
preferences for light and\n00:04:54.270 temperature its weeks the
environment\n00:04:56.099 you step into according to 20\n00:04:57.569 centimeters of
accuracy this app tells\n00:05:00.539 the building system when rooms are\n00:05:01.889
unoccupied which means when the zero\n00:05:03.779 occupancy is next to zero energy
use the\n00:05:07.289 building is learning everyday and\n00:05:08.789 because it is
connected to the internet\n00:05:10.229 it is future proofed so they can add
new\n00:05:12.240 sensors as technology advances in the\n00:05:13.919 future finally
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summer\n00:05:18.330 months almost 400 feet into the aquifer\n00:05:20.460 below it
sits it insulated into the\n00:05:23.279 winter when it is sucked back out
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intelligent and that are not using any\n00:05:40.169 energy anymore\n00:05:40.820
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Building Controls&quot;;&quot;abstract&quot;:&quot;Urban development has a significant
role to play within the broader context of achieving ecologically sustainable
development (ESD). In particular, adverse impacts caused by buildings are a major
component of the overall ecological footprints of cities. The Australian state of
Victoria does not have statutory planning instruments in which ESD assessment
requirements for buildings are embedded, relying on building regulations alone. In the
absence of state-wide regulatory controls, several local governments have implemented
both voluntary and mandatory requirements for ESD assessment at the planning approval
stage. This gives rise to an important question: should elements of these ESD
assessment requirements developed and/or implemented by Victorian local governments be
integrated into state-wide planning controls? In answering this, the study provides an
overview of ESD considerations for built form in Victorian planning legislation. It
also examines the approach of a number of local governments in Victoria that are using
locally developed planning controls to set standards for the environmental performance
of buildings. The discussion focuses on the results of the state planning policy
analysis, evaluation of ESD assessment requirements implemented by local government
and interviews with local government officers responsible for administering said
requirements. The findings of the study show that inadequate attention has been given
to the issue of environmental assessment of buildings through development control in
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Victoria. Local governments' experience in using development control to address ESD indicates that there is potential to extend these requirements state-wide. The article concludes with broad observations as to how green buildings could be better achieved through the planning permit process, via regulatory reform.

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 "abstract": "The article analyzes the main aspects of green building implementation as an element of promoting the achievement of sustainable development goals and improving the environmental safety of urbanized systems. The article highlights the sustainable development goals on which green building has a direct or indirect impact, indicating the criteria for improving the environment, promoting resource conservation and energy efficiency. Today, the construction industry in Ukraine is one of the largest polluters of the environment, along with industrial enterprises and transportation. That is why the issue of

minimizing the construction industry's impact on the environment is relevant. To determine the real impact of a building on the environment, it is proposed to use innovative methods, such as life cycle analysis, which is a systematic approach to assessing the environmental and social impact of a building throughout its life, including design, construction, operation, and reconstruction/demolition. This analysis helps to determine the optimal construction solutions, taking into account the requirements of biosphere compatibility and sustainable development. The article describes the main advantages of green building. Green buildings use energy-efficient technologies and materials that help reduce emissions of harmful substances into the air and water. This helps to reduce environmental pollution and improve air quality. Green buildings often use solar panels, wind turbines, and other sources of renewable energy to help reduce dependence on fossil fuel consumption and ensure a stable energy supply. Green buildings aim to reduce the consumption of natural resources, such as water and wood, through the implementation of efficient resource management systems and the use of recycled materials. Green building can contribute to the development of sustainable infrastructure, such as efficient water supply, sewerage and urban transport systems, which ensures the sustainable functioning of urbanized systems. The article highlights the main concepts that contribute to improving environmental safety and achieving sustainable development goals: the use of energy-efficient materials and technologies, the use of renewable energy sources, reducing the consumption of natural resources, and promoting the development of sustainable infrastructure in urbanized systems. The author highlights the limited legal, regulatory and legislative framework for the implementation of green building as one of the elements for further analysis of the possibility of implementing European standards in state legislation.

Keywords: environmental safety, green building, sustainable development, urban systems, innovative solutions

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public infrastructure, by mitigating impacts and producing inputs at the source (energy and water, for example), with direct and beneficial consequences for the government, paving the way for future incorporation of criteria in municipal legislation.

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148";,"search_result_number";:5}, {"paper_title";:"Integrating strategic environmental assessment and material flow accounting: a novel approach for moving towards sustainable urban futures";,"abstract";:"PurposeThe population living in urban areas of the world continues to grow rapidly. It is, thus, a great priority for the planning practice to embed sustainability concept in their urban development endeavors. Currently, development and expansion of urban systems stress the need to control consumption of resources, especially non-renewable ones. There is also a need to reduce related environmental impacts, while stimulating a sustainable pathway for the population and urban growth. MethodsStrategic environmental assessment (SEA) is useful for policy design to build an integrated method for supporting the development of a sustainable society. It undertakes territorial assessments and describes urban flows and impacts related to them by using a variety of tools, including material flow accounting (MFA). This study employs MFA, as it fits well within the scope of SEA and supports the growing environmental attention in the urban metabolism approach. Although helpful, MFA has not been systematically applied in the urban development context; for this reason, this paper proposes the integration of SEA and MFA. Results and discussionIntegration of SEA and MFA generates a new framework for sustainable development planning. The framework is structured in phases oriented to the continual improvement based on the Deming cycle (i.e., plan, do, check, act), a key management approach mainly used in businesses for improving the effectiveness of an organization. It can also be implemented at the urban system level. In order to maintain normative compliance, each process (urban planning, strategic environmental assessment with urban metabolism approach, participatory processes) is standardized in line with a common and mandatory approach. While the processes are integrated among them, highlighting the reciprocal contact points, the results are combined in a holistic perspective. The framework, hence, transforms the voluntary MFA tool into a mandatory process. ConclusionsThe proposed SEA-MFA framework has the potential to unify and standardize the processes of categorizing and quantifying data in order to improve the understanding of urban metabolic principles and scale effects. It also supports management and policy development and meets the requirements of different stakeholders. The framework, thus, generated a novel approach for sustainable urban development planning by providing solutions for specific policy problems and ensuring urban ecological balance and sustainable urban futures.";,"paper_authors";:["G. Ioppolo";,"S. Cucurachi";,"R. Salomone";,"Lei Shi";,"Tan Yigitcanlar"],"paper_publish_year";:2018,"publication_journal_name";:"The International Journal of Life Cycle Assessment";,"consensus_paper_details_url";:"https://consensus.app/papers/integrating-material-flow-accounting-approach-moving-ioppolo/04662f40569357c7a230f5e24c3e5c79/?utm_source=chatgpt";,"doi";:"10.1007/s11367-018-1494-0";,"volume";:"24";,"pages";:"1269-1284";,"search_result_number";:6}, {"paper_title";:"Framework for integration of urban planning, strategic environmental assessment and ecological planning for urban sustainability within the context of China";,"abstract";:"Sustainable development or sustainability has been highlighted as an essential principle in urban master planning, with increasing recognition that uncontrollable urbanization may well give rise to various issues such

as overexploitation of natural resources, ecosystem destruction, environmental pollution and large-scale climate change. Thus, it is deemed necessary to modify the existing urban and regional administrative system so as to cope with the challenges urban planning is being confronted with and realize the purpose of urban sustainability. This paper contributed to proposing a mechanism which helps to make urban planning with full consideration of issues with respect to sustainable development. We suggested that the integration of urban planning, SEA and ecological planning be a multi-win strategy to offset deficiency of each mentioned political tool being individually applied. We also proposed a framework where SEA and ecological planning are fully incorporated into urban planning, which forms a two-way constraint mechanism to ascertain environmental quality of urban planning, although in practice, planning and SEA processes may conditionally be unified. Moreover, as shown in the case study, the integration of the three political tools may be constrained due to slow changes in the contextual factors, in particular the political and cultural dimensions. Currently within the context of China, there may be three major elements which facilitate integration of the three political tools, which are (1) regulatory requirement of PEIA on urban planning, (2) the promotion or strong administrative support from government on eco-district building, and (3) the willingness of urban planners to collaborate with SEA experts or ecologists.

paper_authors: [Jia He, Cun-kuan Bao, Ting-Fei Shu, Xiao-Xue Yun, D.

Environment";,"consensus_paper_details_url";:"https://consensus.app/papers/system-approach-analysis-buildings-lombera/053095d1bafb5830b10b3fb3053c1a49/?utm_source=chatgpt";,"doi";:"10.1016/J.BUILDENV.2009.08.012";,"volume";:"45";,"pages";:"673-

683";,"search_result_number";:8}, {"paper_title";:"Integration of environmental impact assessment into decision-making process: practice of urban and rural planning in China";,"abstract";:"Abstract In China, the development of plan environmental impact assessment (PEIA) has been greatly promoted and facilitated by the Law of the People's Republic of China on Environmental Impact Assessment (the EIA Law). Yet, the defects of PEIA rooted in the institutional design have emerged along with its progress and enhancement. Consequently, PEIA is usually excluded from the planning process and cannot play the essential role in promoting sustainable development, given that, for most of the non-environmental departments, PEIA is generally regarded as an external interference in executive power and eventually rejected. Hence, in order to improve and perfect PEIA in the future, it is strongly recommended that PEIA should be integrated with the decision-making system to fulfill the designed functions. Through urban and rural plan, the purpose of this study is to explore the opportunities and means to integrate PEIA with urban and rural plan at both the institutional and operational levels. The implementing framework for the integration of PEIA with urban and rural plan was first proposed, and ten important decision-making stages of the urban and rural plan process were identified as well as ten corresponding stages of PEIA. Additionally, the PEIA process was integrated with the decision-making process at several crucial stages to demonstrate the full integration of PEIA with urban and rural plan.";,"paper_authors";:["Jing Wu";,"I. Chang";,"K. Lam";,"M. Shi";],"paper_publish_year";:2014,"publication_journal_name";:"Journal of Cleaner

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108";,"search_result_number";:9}, {"paper_title";:"Towards sustainable building design";,"abstract";:"Work recently undertaken at the University of Strathclyde, Department of Architecture, is concerned with the articulation of a management system that might support sustainable design. Aligned with the international standard ISO 14001, a system has been piloted in housing development projects around Glasgow, and offers a supporting framework for the implementation of agreed actions and addresses a number of key urban planning and building design tasks incorporating six related themes. This paper will discuss the context and introduce the themes of Human Impact (including consideration of quality of life issues, consultation and social inclusion, development factors, health factors, comfort levels, accessibility, public transportation, facilities for cyclists); Environmental Impact (including consideration of protection of local ecological features/biodiversity, environmental assessment); Pollution Prevention (including consideration of indoor air quality (emissions from equipment, out-gassing of toxins/radiations), elimination of toxins, control of pollutants during constructions);

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Sustainability Management (including consideration of integrated and systemic approaches e.g. sustainability/environmental performance targets, management systems and procedures, construction management, commissioning, dissemination workshops, post-occupancy feedback visits); Resource Efficiency (including consideration of, lean design, material use and recycling, embodied energy, water consumption and conservation); and Energy Efficiency (including consideration of, targets, benchmarks and best practice energy use, passive solar, renewable energy, thermal modelling, insulation, ventilation, heating, CHP, heat recovery. ";";paper_authors";:";David Grierson";],";paper_publish_year";:2009,";publication_journal_name";:";Design Principles and Practices: An International Journal";,";consensus_paper_details_url";:";https://consensus.app/papers/towards-building-design-grierson/ad6911caf38d59049bbb63866f7f55a3/?utm_source=chatgpt";,";doi";:";10.18848/1833-1874/CGP/V03I03/37682";,";volume";:";3";,";pages";:";143-152";,";search_result_number";:10}, {";paper_title";:";Beyond the buildingcentric approach: A vision for an integrated evaluation of sustainable buildings";,";abstract";:";Abstract The available sustainable building evaluation systems have produced a new environmental design paradigm. However, there is an increasing need to overcome the buildingcentric approach of these systems, in order to further exploit their innovate potential for sustainable building practices. The paper takes this challenge by developing a cross-scale evaluation approach focusing on the reliability of sustainable building design solutions for the context in which the building is situated. An integrated building\u2013urban evaluation model is proposed based on the urban matrix, which is a conceptualisation of the built environment as a social\u2013ecological system. The model aims at evaluating the sustainability of a building considering it as an active entity contributing to the resilience of the urban matrix. Few holistic performance indicators are used for evaluating such contribution, so expressing the building reliability. The discussion on the efficacy of the model shows that it works as a heuristic tool, supporting the acquisition of a better insight into the complexity which characterises the relationships between the building and the built environment sustainability. Shading new lights on the meaning of sustainable buildings, the model can play a positive role in innovating sustainable building design practices, thus complementing current evaluation systems.";,";paper_authors";:";E. Conte";,";V. Monno";],";paper_publish_year";:2012,";publication_journal_name";:";Environmental Impact Assessment Review";,";consensus_paper_details_url";:";https://consensus.app/papers/beyond-approach-vision-integrated-evaluation-buildings-conte/7fe87dd9073f5bf0a6d8d3c83a18a2bc/?utm_source=chatgpt";,";doi";:";10.1016/J.EIAR.2011.12.003";,";volume";:";34";,";pages";:";31-40";,";search_result_number";:11}, {";paper_title";:";Integrati on of urban developers with regard to social and environmental responsibility";,";abstract";:";The aim of this study is to develop a model for institutionalizing the social and environmental responsibility of the construction business as an important factor in the modern urban development. Methods

of systems, logical and comparative analysis, as well as a questionnaire survey are used in the research. Based on the situation in Tomsk (Russia), public preferences and needs for construction products have been examined taking into account environmental friendliness and the quality of the urban environment. The results of the examination are presented in this paper. The study reveals the public need for building products and shows how these needs are related to greening the construction industry and developing the social and environmental responsibility of the construction business. The green urban development needs an environmentally sustainable regulation mechanism based on appropriate methods, tools and organizational forms of interactions between stakeholders in the construction industry. A concept for managing interactions between stakeholders in urban development is proposed on the basis of the ECOURBANBUILD platform. The integration based on this platform will create additional opportunities to implement the social and environmental responsibility of the construction business in the interests of sustainable urban

development. ";";paper_authors";:[";I. Nuzhina";,";Maria Zolotareva";,";I.

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Tup\u0117nait\u0117";,";A. Kaklauskas";,";I. Lill";,";I.

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responsibility";,"abstract";"The aim of this study is to develop a model for institutionalizing the social and environmental responsibility of the construction business as an important factor in the modern urban development. Methods of systems, logical and comparative analysis, as well as a questionnaire survey are used in the research. Based on the situation in Tomsk (Russia), public preferences and needs for construction products have been examined taking into account environmental friendliness and the quality of the urban environment. The results of the examination are presented in this paper. The study reveals the public need for building products and shows how these needs are related to greening the construction industry and developing the social and environmental responsibility of the construction business. The green urban development needs an environmentally sustainable regulation mechanism based on appropriate methods, tools and organizational forms of interactions between stakeholders in the construction industry. A concept for managing interactions between stakeholders in urban development is proposed on the basis of the ECOURBANBUILD platform. The integration based on this platform will create additional opportunities to implement the social and environmental responsibility of the construction business in the interests of sustainable urban

development.";,"paper_authors":["Irina Nuzhina";,"Maria Zolotareva";,"Iuliia

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While various methods for assessing the environmental impact of residential buildings are available and a number of certifications have been created, these certifications do not actually help home owners and users, but rather are endorsing buildings that have been constructed with no attempt at sustainability, thus making the diffusion of any sustainability criteria in construction that much more difficult. This study aims to develop a simple user-friendly tool for home owners that provides the same rigor that current sustainability certificates offer the professional builder and property developer. A sustainability appraisal is carried out based on social, environmental and economic impacts, each of which is evaluated using easily understandable parameters. The integrated system is then verified through the case study of a real residential building. The subsequent results demonstrate a better building performance when pursuing green demand in housing and also indicate the changes required for improvement. In applying this new integrated tool we are able to confirm its ease of use, along with its highly comparable results with any other evaluation tools currently available.";,"paper_authors":["J.

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118", "search_result_number";15}, {"paper_title";"Sustainability in the Built Environment: Integrating Scales of Action and

Evaluation", "abstract";"Urban sustainability is still far from being reached. This situation testifies the difficulties to plan, design, implement and manage sustainable development processes in an integrative perspective. There are several cognitive, political and technological challenges to be faced in order to change this situation and make sustainabilisation process of the city more effective. In this paper we focus on issues concerning our ability to learn to integrate social, economic and environmental aspects through evaluation of sustainability in the city.

To oppose the inconsistency of action shown by the weak results we have obtained from our investments in sustainable development during last decades, this paper argues that we need to think about sustainability of the built environment and its evaluation taking into account spatial issues, usually underestimated or assimilated to a problem of scale in the current evaluation frameworks. Following the results obtained in relation to the construction of an integrated urban-building evaluation framework, the paper underlines that if approached as spatially sensitive, evaluation of sustainability carried out at any scale would be aimed at stimulating the regenerative capacity of places. Keywords: Built environment; Regenerative Development; Spatial Sustainability; Integrated Evaluation", "paper_authors";["V. Monno", "E. Conte"], "paper_publish_year";2015, "publication_journal_name";"European Journal of Sustainable

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contribution to traditional urban planning instruments and moves a step forward with regard to the construction of sustainability. In this framework indicators become key instruments in urban analysis, the design of policies, strategies, actions and programs for sustainable urban development. The paper starts by introducing the methodology and the urban sustainable indicators system for planning. This model then is tested and applied in a case study based on Mexico City's metabolism. Finally, the study provides a series of reflections on how successful strategies to enhance the long-term sustainability of cities can be developed by introducing sustainability indicators into the urban planning

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647","search_result_number":17}, {"paper_title":"Taming expansive land use dynamics \u2013 Sustainable land use regulation and urban sprawl in a comparative perspective","abstract":"Urban sprawl and infrastructure pose a major sustainability challenge. It is therefore extremely important for countries to implement advanced land use planning and steering instruments that are designed to mitigate urban sprawl and to enforce thrift development within a coherent legal framework of sustainable land use governance. The following article presents the results of a comparative legal assessment that looks at how this major challenge is tackled in certain countries (Germany, Switzerland, the Netherlands, Spain, Poland). The assessment is placed within a broader analytic framework based upon four key requirements of sustainable land use regulation which are also important precondition to successful mitigation of urban sprawl. These key requirements of sustainable land use regulation are described in the first part of the article. In the second part we present the results of the comparative assessment and describe how the key requirements are implemented in the land use regimes of the countries assessed, with a special focus on the mitigation of open space consumption. The evaluation shows the extent to which Germany, Switzerland, the Netherlands, Spain and Poland have advanced in adjusting their environmental and planning laws to the demands of sustainability and how, despite this, diverse opportunities for improvement remain. One important conclusion relates to the key requirement of setting clear sustainability targets and implementing regulatory mechanisms relating to those targets. In this regard a major deficiency of the existing national approaches lies in the fact that, so far, only two countries have set clear political targets: Germany has set a target to reduce land take for human settlements and transport infrastructure to a maximum of 30 ha a day and Switzerland has set a target of limiting land consumption for residential purposes at 400 m² per capita. But even there, there is no effective regime in place to ensure that the targets are met. Another conclusion relates to the key requirement of integrated and responsive steering and points to the importance of formal planning and assessment regimes in ensuring that shared environmental interests are properly integrated and that spatial planning and zoning are regularly monitored and reviewed. In this regard, we see that all the countries assessed have implemented monitoring systems and formal

Environmental Assessments (EA) for land use and construction plans. However, the way these EAs are designed differs considerably, and therefore the national implementation is sometimes ineffective.

“paper_authors”: [“J. Bovet”, “M. Reese”, “Wolfgang K\u00f6ck”, “], “paper_publish_year”: 2017, “publication_journal_name”: “Land Use Policy”, “consensus_paper_details_url”: “https://consensus.app/papers/taming-land-dynamics-land-regulation-sprawl-perspective-bovet/c3f6e252be20546eb95dcbcb2dc4bbc2/?utm_source=chatgpt”, “doi”: “10.1016/J.LANDUSEPOL.2017.03.024”, “volume”: “”, “pages”: “”, “search_result_number”: 18}, {“paper_title”: “An Analysis of the Most Adopted Rating Systems for Assessing the Environmental Impact of Buildings”, “abstract”: “Rating systems for assessing the environmental impact of buildings are technical instruments that aim to evaluate the environmental impact of buildings and construction projects. In some cases, these rating systems can also cover urban-scale projects, community projects, and infrastructures. These schemes are designed to assist project management in making the projects more sustainable by providing frameworks with precise criteria for assessing the various aspects of a building’s environmental impact. Given the growing interest in sustainable development worldwide, many rating systems for assessing the environmental impact of buildings have been established in recent years, each one with its peculiarities and fields of applicability. The present work is motivated by an interest in emphasizing such differences to better understand these rating systems and extract the main implications to building design. It also attempts to summarize in a user-friendly form the vast and fragmented assortment of information that is available today. The analysis focuses on the six main rating systems: the Building Research Establishment Environmental Assessment Methodology (BREEAM), the Comprehensive Assessment System for Built Environment Efficiency (CASBEE), the Deutsche Gesellschaft für Nachhaltiges Bauen (DGNB), the Haute Qualite Environnementale (HQETM), the Leadership in Energy and Environmental Design (LEED), and the Sustainable Building Tool (SBTool).”, “paper_authors”: [“E. Bernardi”, “S. Carlucci”, “C. Cornaro”, “R. Bohne”, “], “paper_publish_year”: 2017, “publication_journal_name”: “Sustainability”, “consensus_paper_details_url”: “https://consensus.app/papers/analysis-rating-systems-assessing-environmental-impact-bernardi/6c75caa88e6d5d22982a202b77d2b416/?utm_source=chatgpt”, “doi”: “10.3390/SU9071226”, “volume”: “9”, “pages”: “1226”, “search_result_number”: 19}, {“paper_title”: “Ecological criteria considering the connections between the construction, building-site and the spatial planning development”, “abstract”: “The integration purpose of the ecological criteria in the projecting process is preceded by an intrinsic connection between the existential building space and global environment. The starting point is given by the evaluation of the balance amongst the functional resources of both systems, natural and anthropic. Thus, the ecological criteria open a path for the project leaders to identify and to evaluate the renewable resources potential, as alternative sources, and also their impact on the natural environment. In regard of the anthropic geo-system, following the increase of the population density in the urban areas, or of the depopulation of the rural areas due to the migration of the population to the metropolitan areas, the ecological answer is