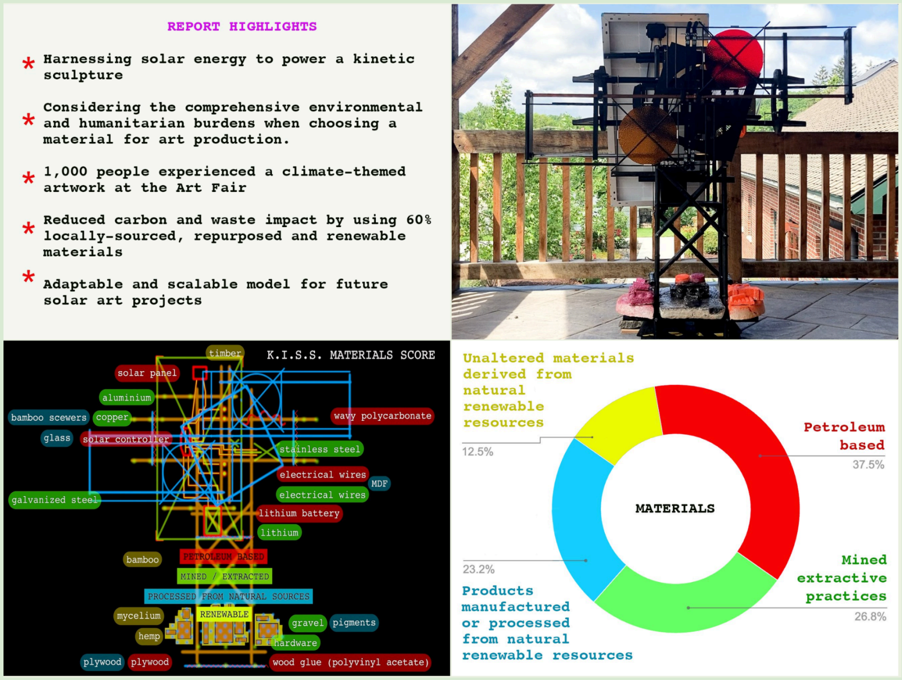
K.I.S.S. (Kinetic Independent Solar System) | **Deville Cohen & Kim Kraczon**

CLIMATE IMPACT REPORT (CIR) 2023-24

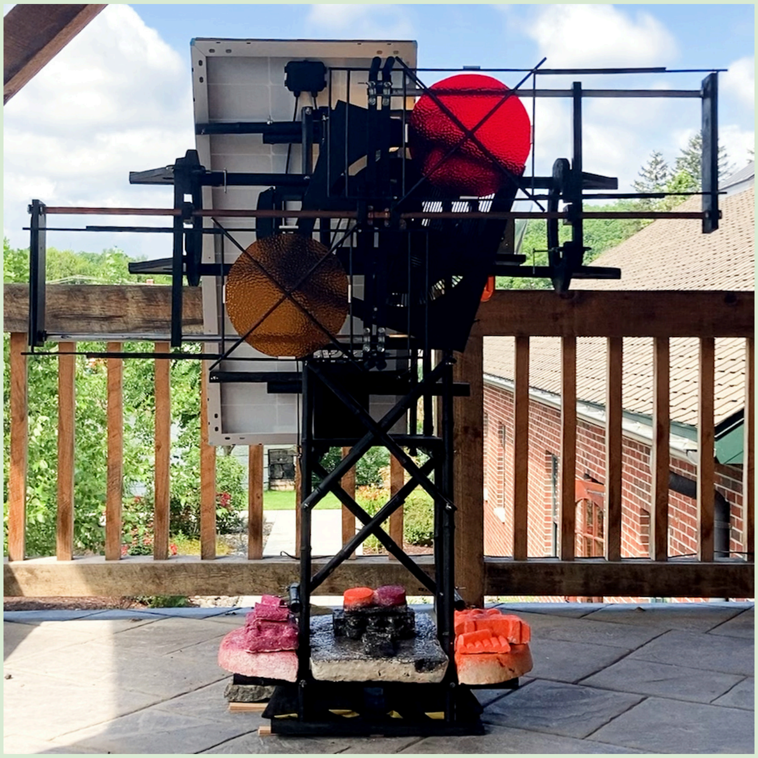
https://www.artistscommit.com/reports/kiss

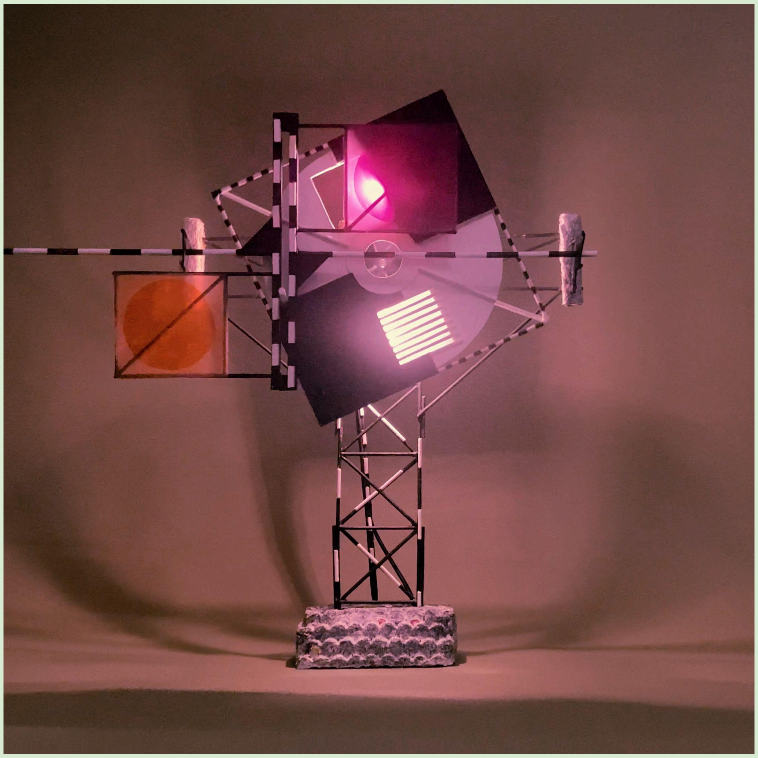
All materials have an environmental burden. It's not a matter of categorizing the materials we use in art production as "good" or "bad" for the environment, but rather understanding the varied consequences *and* potential benefits of choosing one material over another. The term "sustainable" in the context of materials is vaguely understood—we often encounter the term in greenwashing campaigns and marketing ploys, stripping the word of its meaning. The United Nations defines sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own needs." But we must also ask, sustainable in what sense - whose needs are these materials sustaining? Are we sustaining the continued availability of certain materials well into the future? Sustaining the function of these materials with alternatives? Meeting the needs for the development and trajectory of one particular society? Sustaining the ecosystems providing the necessary resources parallel to human development? If so, which ones and to what extent?

What are we sustaining?



In June 2023 Deville Cohen, a founding member of **Artists Commit**, represented the organization at NADA Foreland by presenting K.I.S.S. (Kinetic Independent Solar System), the first prototype in a series of outdoor kinetic light sculptures that are powered by collected and stored solar energy. He also provided information about Artists Commit activities, including Climate Impact Reports, resources, and related literature at a booth in the community market. K.I.S.S.'s kinetic design is based on SWIPE, a model made with 12V motors and lights that use custom-designed mechanisms and gears made of mycelium, bamboo, and milk paint. For the outdoor demands of the series, Deville conducted research about sustainable waterproof and UV-resistant materials to withstand inclement weather conditions. For the creation of K.I.S.S. and this Climate Impact Report, Deville collaborated with Kim Kraczon, a Berlin-based conservator of modern materials and contemporary art, director of materials at Ki-culture, and advisor at Gallery Climate Coalition, to conduct research for sustainable materials and working methods.





K.I.S.S. (Swipe) 67 x 70 x 33 inches

Practical Light: SWIPE (12 x 18 x 16 inches)

K.I.S.S (Kinetic Independent Solar System)
Dimensions: 67 inches high, 70 inches wide, 33 inches deep
Materials: mycelium and hemp substrate, bamboo, pigments, gravel marble, wood glue (polyvinyl acetate), cardboard, foam core, copper, galvanized steel pipes, plywood, MDF, hardware (steel), hardware (stainless steel), plastic, stained glass, chain lube.
Devices: motor, electrical wires, solar panel (50 W), solar controller, lithium battery (50 Ah)

Practical Light: Swipe
Mycelium, hemp, bamboo, cardboard, foam core, milk paint, pigments, wood glue, pebbles, motor, lights, wire, switch, plug, and light gels.
23 x 9 x 18 inches

K.I.S.S. power capacity information:
The 100-watt solar panel charges the 50 Ah battery when exposed to sunlight in about 6.2 hours.
K.I.S.S. total energy use:
Motor: 12V x 5.4 amp = 64.8 Watts hours
Lights x2: 12v x 0.12: 1 watt, 10 Watt-hours (x2)= 20 Watts hours
Total: 84.8 Watt-hours which are 7.06Ah
When fully charged or exposed to sunlight K.I.S.S. is available to provide the remaining 42.9 Ah of electricity an hour to other systems or devices (this is scalable with additional panels and storage capabilities)

TEAM

DEVILLE COHEN KIM KRACZON

PARTNERS

NADA FORELAND

Deville's Climate Statement

My interest in shifting to renewable energy began after I created my first Climate Impact Report (CIR) in 2021 for my video installation DE-SUICIDE at PS122 Gallery in NYC. My report demonstrated that a significant portion of the installation's carbon footprint was a result of the energy consumption related to the variety of media, computers, projectors, lights, and motorized elements in the installation. As autonomous kinetic sculptures or portable power hubs, I see the potential of K.I.S.S. to collapse the distinction between an art object and the infrastructure or the institution that houses it and to merge them in their efforts toward sustainability.

Facing the climate crisis, I was often overwhelmed by its scale and complexity. As an artist, I want to meet the crisis not at the scale of the problem but at the scale of my agency. Problems, challenges, difficulties, and obstacles are what I face in the studio every day. My ability to meet these insurmountable challenges with creativity is where I chose to locate my agency as an artist. In order to sustain an artist practice, I can't look away from the complicit irresponsibility of being a consumer and creator of culture. My desire and need to maintain a practice under the limitations of available materials, resources, supply chains, and support demonstrates my commitment to climate consciousness with many contradictions and conflicts. I am not a scientist, a journalist, nor a businessman—to meet the personal sustainability targets of my practice, I choose to invest my creativity, innovation, research, and experimentation to explore the speculative and the imaginative. As a founding member of Artists Commit I leverage my climate-conscious practices to contribute to the growing available resources and education around renewable energy and material choices and to continue to advocate for the Arts to be part of the paradigm and practical shifts needed to address our current global crises.

Kim's Climate statement

The driving force behind my pursuit of finding sustainable solutions for the art sector is primarily one of frustration. As a conservator of modern materials and contemporary art, I've been hyper-focused over the past few years on finding materials with the least amount of environmental and social burden for art production, exhibition-making, and fine art shipping. I've always held the hope that sustainable solutions would surface through a technological breakthrough – that we'll find a way to manifest net-zero materials that cause minimal detriment to ecosystems and humans in their raw material extraction, production, transport, and end-of-life disposal. When I started researching materials for the Waste and Materials Ki Book in 2019, the possibilities of nascent industrially manufactured bioplastics and a slew of so-called sustainable, green, or eco-friendly materials on the market boasting plant-based, natural compositions, and promising biodegradability and compostability seemingly offered sustainable solutions to our steady consumption of materials in the art and cultural sector. After many years of researching "sustainable" materials – materials that are sold to us consumers as causing less detriment to the environment, it has become increasingly evident that there are no silver bullet sustainable solutions for materials but rather negotiations among a range of impact categories. While the ongoing development of DIY bioplastics derived from renewable, carbon-sequestering feedstock such as algae and bacteria or utilizing biowaste for small-scale production minimizes impact across many environmental and social burden categories, the only real strategy to mitigate the negative impacts of materials on a large scale is the reduction of our consumption by increasing efforts to repair, reuse, repurpose, and enter into a circular/share economy. In this sense, the solution is among us and in reach.

MATERIALS

When used as a descriptor for materials, the terms sustainable, eco-friendly, and green are widely understood as alleging one or more of the following: non-toxic, manufactured from natural resources, manufactured with recycled content, biodegradable, compostable, 100% recyclable. *Low carbon footprint* has also recently entered into our lexicon in selecting materials. While minimizing the carbon footprint of the artwork is a foremost concern, as carbon emissions are currently surpassing global limits with little recourse, assessing the environmental burden of materials is a nuanced endeavor requiring additional environmental considerations, such as land use, water footprint, environmental justice issues, toxicity, and end-of-life management. Choosing one option that is seemingly "environmentally friendly" often reveals other socio-environmental impacts that reverberate in an unexpected manner. One's own personal political stance, ethics, and values influence which environmental impact categories are deemed important or worthy of our concern when choosing a particular material over another.

In addition to exploring the transition to renewable energy, we were equally as invested in exploring renewable materials and working processes. The primary environmental burdens for K.I.S.S, in addition to carbon footprint, were toxicity to humans and the natural environment during the manufacturing process, human toxicity while working with the material, and biodegradability or potential for reuse at the end of working life. The material choices for K.I.S.S. were focused on four main areas: 1) solar energy instead of grid energy; 2) bamboo and mycelium as the main building materials; 3) structural joints utilizing hardware instead of adhesives; 4) experimenting with pit-lime milk paint.

CHALLENGES

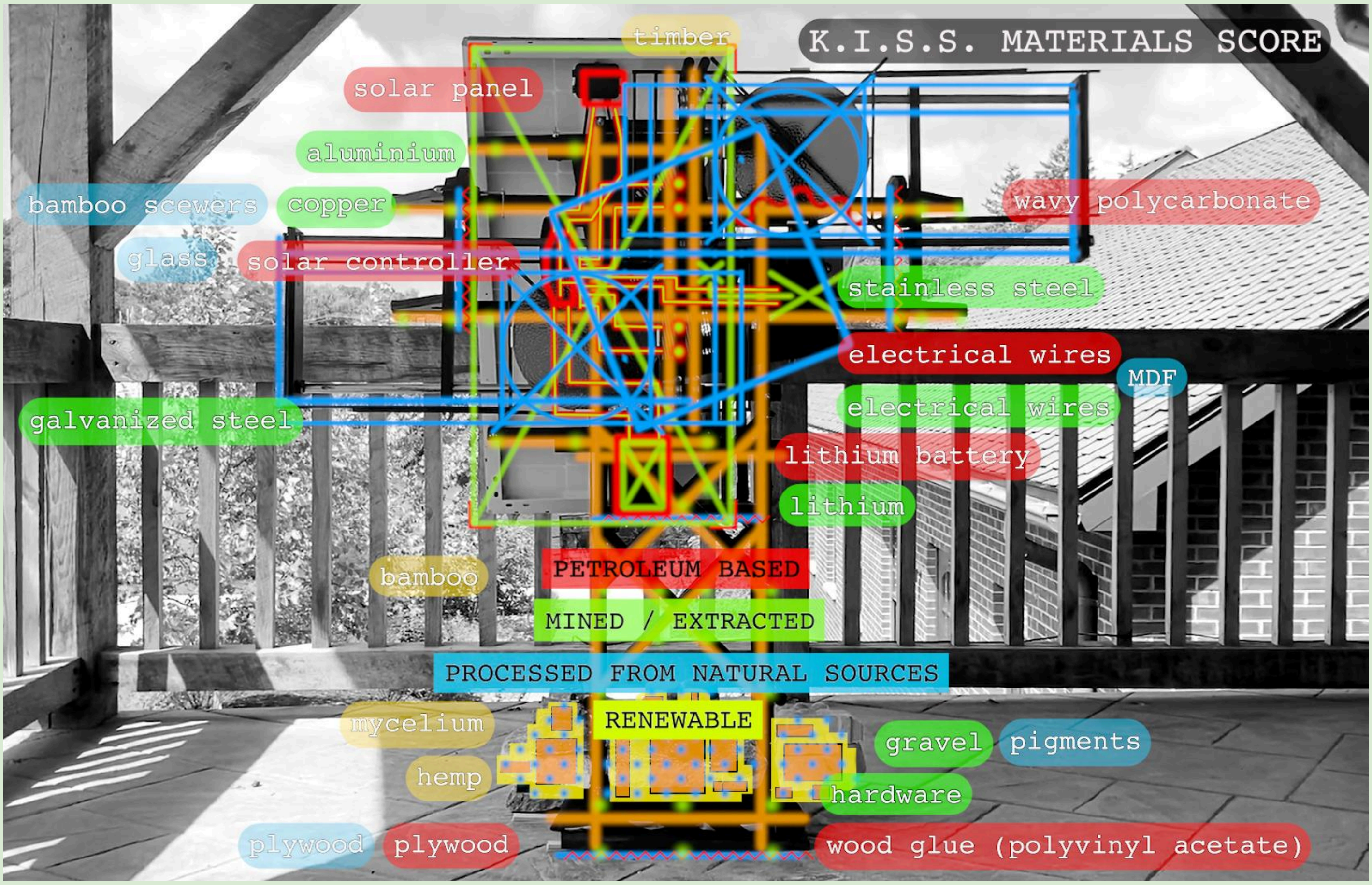
The research on renewable solar energy and sustainable materials for K.I.S.S. presented overlapping areas of concern with their dependency on extractive practices. Phasing out fossil fuels in the transition to low-carbon energy sources is still dependent on metal extraction such as lithium, cobalt, copper, and aluminum for energy storage and hardware, while other materials used for the housing of technologies are primarily petroleum-based plastics.

The report aims to encourage transparency, self-guided research, and personal reflection in choosing materials for producing and presenting artworks. Weighing all considerations in the decision-making process inevitably results in a compromise or trade-off, debunking the concept of "silver bullet" solutions in our collective pursuit to mitigate the environmental burdens associated with creating and fabricating tangible art objects. The findings from this report more than anything confront the inescapable consequences of material usage and ultimately underscore the urgency in reducing consumption of new materials in general by prioritizing reducing, reusing, and repurposing.

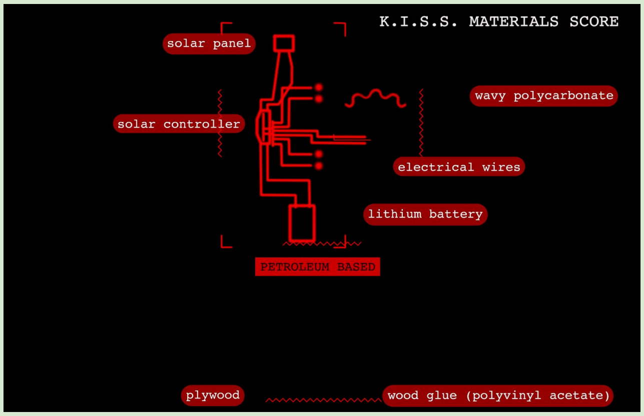
METHODOLOGY

For the purpose of this report, we divided the 20+ materials used for the prototype into five major categories:

1. **Petroleum-based**
2. **Mined extractive practices**
3. **Products manufactured or processed from natural renewable resources**
4. **Unaltered materials derived from natural renewable resources**



LINK TO K.I.S.S MATERIALS SCORE VIDEO



01: Petroleum-based

Plastics are petrochemical-derived and processed synthetically, often releasing toxic chemicals into the surrounding environment. Greenhouse gases are emitted at each stage of the plastic lifecycle: 1) fossil fuel extraction and transport, 2) plastic refining and manufacture, 3) managing plastic waste, and 4) plastic's ongoing impact once it reaches our oceans, waterways, and landscape.

Many adhesives that artists use in their practice are nothing more than viscous plastic. To reduce and mostly avoid the use of synthetic glue for K.I.S.S., we opted to use hardware on the bamboo structure (screws, washers, nuts, wing nuts, and L brackets). The use of hardware introduces flexibility in the design process, new holes can be drilled and structural lines and points can be removed, added, and repositioned. A small amount of glue was used in the delicate parts of the front piece that is holding the stained glass circles.

The topic of plastics in the discourse surrounding climate change tends to be divisive. Research institutes (Manchester Sustainable Materials Innovation Hub, McKinsey) tout the low carbon footprint of certain plastics as crucial for decarbonization goals, citing recycled plastics often have a lower greenhouse gas impact than their equivalent non-plastic alternatives. While some plastics do boast a relatively low carbon footprint—especially plastics with recycled content—the toxicity and microplastic contamination from the production, use, and disposal of fossil fuel-derived plastics have far-reaching impacts that humans are only now beginning to comprehend. Abysmally low recycling rates (8% of all plastics ever manufactured have been recycled) and mounting plastic contamination of the natural environment (8 million tons of plastic enter the ocean every year) raise concern over the impact our reliance on ubiquitous single-use plastics which are continually discarded and replaced, accounting for more than 1.3 billion metric tons of CO_2 emissions generated per year.

<u>Pit Lime Paint:</u> Paint was the most challenging material research in the process. For the SWIPE model, Deville used casein milk paint mixed with black and white pigments. Casein is the most prominent protein component in milk. To turn casein into a strong and glutinous medium for both paint and glue, it requires an alkaline component, such as pit lime, Borax®, or ammonium carbonate. The milk paint Deville used for the model was a combination of casein and Borax®, which is ideal for indoor conditions but it is not a water-resilient paint. Lime requires less energy to produce than cement because limestone, the basic raw material, can be burned at lower temperatures—900-1,000C rather than 1,300C or higher. Also, some of the CO_2 created during firing is reabsorbed by lime as it cures. Lime additionally can be produced locally on a small scale, cutting pollution by limiting transport distances.

A combination of casein with pit lime is supposed to provide a water-resistant paint but is more challenging because of the tedious preparation process and its short working time. While several tests with this mixture failed to attach to the bamboo surface, it adhered well to the plywood and pine. Deville tried sanding the bamboo to provide the paint with a textured surface area to adhere to but the paint still flaked off. He ended up using a combination approach of pit-lime milk paint for the pine and plywood surfaces and commercially available acrylic-based enamel paint for the bamboo structures.

Material	Quantity	New/ Reused/ Reclaimed	End-of-working-life management	Notes on supply chain	Estimated Carbon footprint
Wood glue (polyvinyl acetate)	50 ml	New	Biodegradable over an extended period of time in landfill - releases GHG	Local Hardware Store	3.32 kg / 1 kg
Mod Podge (polyvinyl acetate)	200 ml	New	Biodegradable over an extended period of time in a landfill - releases GHG	Local Art supply store	3.32 kg / 1 kg
Foam core	Under 0.09 sq meters	Reused	Incinerated "energy recovery"	Dollar Store	2.25 kg / 1 kg
Cables		New/ Reused	1. Reusable	Local Hardware store	PVC = 2.44 kg / 1 kg Copper = 1.45 kg / 1 kg
Solar controller	2		1. Reusable	Renorgy	Acrylonitrile Butadiene Styrene (ABS) - 3.10 co2 /kg
Lithium battery 50 Ah	2		1. Reusable	Amazon	Unknown, 1 KWh = 150 to 200 kilograms of CO2
Polycarbonate roofing material	0.2 sq meters		1. Reusable	Home Depot	5.5 kg CO2 / kg

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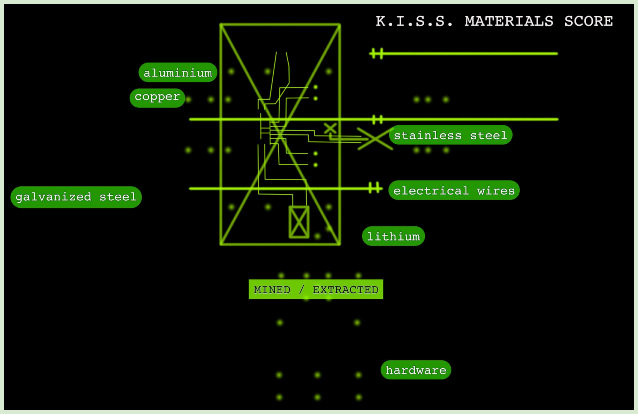

02: Mined extractive practices

Employing a solar panel to provide renewable energy to power the kinetics of K.I.S.S. offers low-carbon energy alternatives to fossil-fuel-derived grid electricity. However, energy from solar panels is renewable only in terms of the source of the energy (the sun) and relies on hardware and housing constructed in part from non-renewable resources imparting a wide range of deleterious environmental and humanitarian impacts.

Materials sourced from mined extractive practices, such as metal ores and minerals used in the production of metal hardware and housing, photovoltaic cells, and the lithium batteries required for storing energy for the solar panels, not only have a very high carbon footprint but additionally contribute to environmental degradation, population displacement, violent conflicts, human rights violations, and other adverse impacts.

Opting for metal hardware to secure joints in the structure of K.I.S.S. in place of synthetic adhesives presents a similar conundrum. The manufacturing of metals uses over 8% of the world's total energy each year and contributes to 10% of the annual greenhouse gas (GHG) emissions. The production of steel is the most energy-consuming and carbon-intensive industrial activity in the world. Steel production requires large inputs of coke, which is extremely damaging to the environment and humans through the emission of highly toxic and carcinogenic chemicals into the air. Copper, with a production rate of around 12 million tons a year, is infinitely recyclable with 2 million tons reclaimed through recycling annually. Recycling copper requires 85% less energy than processing virgin copper and does not diminish the quality, making copper a potentially circular material. Although recycling copper is less detrimental than mining virgin copper ore, the best practice for mitigating the impacts of mining and processing metal is reusing and repurposing in line with the circular economy.

The supply chain for lithium batteries includes mining cobalt, copper, lithium, aluminum, and graphite and the manufacturing of the battery requires an energy-intensive process. One of the most significant issues with mining concerns the humanitarian toll, as mines are governed by the laws in the host countries, and global regulations to safeguard workers' health and safety are non-existent. In addition to humanitarian concerns, mining for the minerals and ores required for lithium battery manufacturing adversely affects ecosystems. Both types of mining (pit extraction/brine extraction) either completely eradicate ecosystems or release toxic chemicals into the surrounding ecosystems. Photovoltaic energy is expected to increase dramatically in the coming decade, putting a strain on the finite resources necessary for the transition to low-carbon energy. In opting for solar panels as a low-carbon, "renewable" energy source, one must question if the longer-term benefit of reducing the carbon emissions from our ever-increasing energy demands outweighs the initial detrimental impact to both humans and the natural environment.

Material	**Quantity**	**New/ Reused/ Reclaimed**	**End-of-working-life management**	**Notes on supply chain**	**Estimated Carbon Footprint**
Copper	1.8 meters	New	Reusable	Hardware store	1.45 kg / 1 kg
Galvanized steel pipes	1.8 meters	New	Reusable	Home Depot	Steel = 0.96 kg / 1 kg Galvanization = 6.94 kg / 1 kg
Motors	0.6 meter	Reused	Reusable	CHANCS Motors	Steel = 0.96 kg / 1 kg
Stainless steel	1kg	New	Reusable	Amazon	Steel = 1.97 kg / 1 kg
Cables	9.1 meters	New/Reused	Reusable	Local hardware store	PVC = 2.44 kg / 1 kg Copper = 1.45 kg / 1 kg
Lithium battery 50 Ah	0.6 meter	New/Reused	Reusable	Amazon	Unknown, 1 KWh = 150 to 200 kilograms of CO_2
Solar panel 50W	0.3 meter	Reusable/ recyclable	*See links below **end-of-life	Online	* **

*What solar panels are made of: https://www.solarchoice.net.au/learn/solar-energy/how-are-solar-panels-made/

**Solar panel end-of-life management:
https://www.irena.org/publications/2016/Jun/End-of-life-management-Solar-Photovoltaic-Panels

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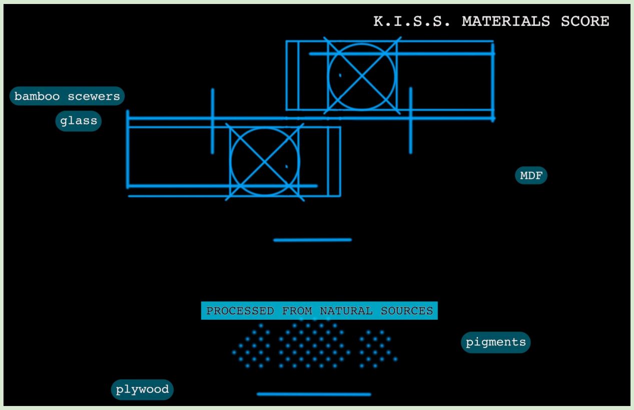


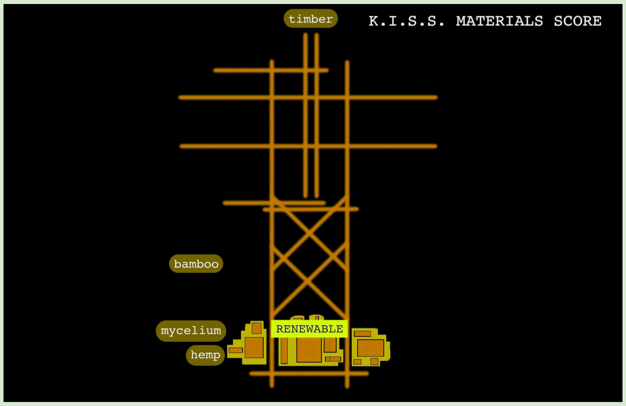
03: Products manufactured or processed from natural renewables Products such as wood or wood pulp have a relatively low carbon footprint because of the carbon sequestering ability of trees, but the manufacturing process increases the carbon footprint, potentially introduces environmental and human toxicity, and restricts the end-of-life management of the product.

MDF and plywood are wood composites traditionally manufactured with formaldehyde-based synthetic resin, which is a known carcinogen and pollutant to ecosystems. The manufacturing process of plywood involves heat pressing the layers of wood veneer together with a synthetic resin for a prolonged amount of time, adding significantly to energy expenditure and carbon emissions. Adhesives and binders also cause recycling issues because of contamination of the wood recycling stream. Plywood is not typically recycled with other wood products and requires specialized recycling facilities. MDF, in contrast, is not recyclable and will go to landfill or be incinerated if not reused or repurposed. Although MDF often uses discarded scrap timber in its manufacturing, the processing of wood products not only decreases the likelihood of recycling at the end of its working life but also increases the carbon footprint of these materials. Untreated, uncoated solid wood also undergoes manufacturing in the form of processing the timber into boards followed by heat drying but should nonetheless be prioritized over composite materials containing synthetic resins or binders. For every dry ton of untreated timber, around 1.8 tons of CO_2 is removed from the atmosphere.

Overlogging and poorly managed forests additionally raise concerns when purchasing products manufactured with wood and wood pulp. Certification programs for wood and wood products, such as FSC (Forest Steward Council) and PEFC (Programme for the Endorsement of Forest Certification) indicate the wood has been sourced responsibly from accredited ethical forest management. Reusing and repurposing again emerges as best practice for wood-based materials, but if purchasing new, opt for products with a high percentage of recycled content or that are FSC (Forest Steward Council) and PEFC (Programme for the Endorsement of Forest Certification) certificated indicating the wood was sourced under responsible forest management.

The manufacturing of glass yields 95 million tons of CO^2 worldwide each year through the energy-intensive and pollutant-emitting process of heating furnaces to upwards of 1500°C to enable the fusion of silica, an alkali, and lime or lead oxide in the formation of the material. Although glass is infinitely recyclable without any loss in quality, the recycling process - although lower in carbon emissions than manufacturing virgin glass - still requires energy-intensive, high temperatures to remelt the glass in the manufacturing of new glass products. Despite the 100% closed-loop recycling potential for glass products, recycling rates for glass are not particularly high in all countries. For example, the most current recycling rate for glass in the USA is 31% compared to 80% in Europe. Glass is also often cited as one of the largest culprits in "wish-cycling," which is a term used to describe the practice of attempting to recycle items that cannot be recycled. Most of the glass we discard in the recycling bin - food and beverage containers - is soda-lime glass, which is one particular composition of glass among many. While the ubiquitous soda-lime glass used for food containers and beverage bottles is curbside recyclable, lead glass, also known as crystal glass, is not. The repurposed stained glass used in the construction of K.I.S.S is composed of lead glass and is not considered curbside recyclable because of the lead released during the remelting process (although it is theoretically recyclable in specialized facilities, which are few and far between). This lead glass is instead diverted to landfills where the embedded lead slowly leeches out of the glass as it corrodes. The unavailability of lead glass recycling coupled with the difficulty in safely disposing of lead glass leaves reusing and repurposing as the only favorable end-of-life management scenarios for the material.

Material	Quantity	New/ Reused/ reclaimed	End-of-working-life management	Notes on supply chain	Estimated Carbon Footprint
Bamboo skewers	33	New	Potential for reuse, Compostable	Dollar store	From China: 0.14kg CO2 / 1 kg
Plywood	0.9 Sq mt	Reused	Reusable	Dyke Lumber	1.07 kg / 1 kg
Pigments	500 gm	New	Non-toxic, naturally-derived pigments will not biodegrade, but are not harmful to the natural environment	Kremer Pigment	Inorganic pigments = 2.3 ± 30 % kg CO2,eq. / 1 kg
Stained Glass	0.3 Sq mt	Reused	Reusable		1.12 kg
Gravel marble	2kg	Reused	Gravel will return to the natural environment through the biodegradation of the mycelium	Home Depot + Backyard og PS122 Gallery	0.64 kg co2 / 1 kg
Gravel aquarium stone	1kg	New	See above (gravel marble)	Shipped from China - Dollar Store	0.64 kg co2 / 1 kg CO2 emissions as a result of transport from China for 1 kg gravel = 0.01 CO2 eq
Cardboard	0.3 Sq mt	Reused	Recyclable	Local Art supply store	0.13 kg / 1 kg
Plywood	0.9 Sq mt	Reused	Reusable	Dyke Lumber	1.07 kg / 1 kg
⅛ inch thick MDF	0.9 Sq mt	Reused	Reusable	Left over from an old IKEA bed	0.72 kg / 1 kg
Chain Lube (vegetable-based)	25 ml	Reused	Landfill		3.81 kg CO_2e / 1 kg



4. Unprocessed materials derived from natural renewable resources

Materials that are unprocessed natural renewable resources, such as bamboo, or derived from natural renewable resources without additional processing, such as mycelium composite, have low carbon footprints by sequestering carbon through their growth and development, are non-toxic, and are fully biodegradable and compostable at their end-of-life.

The linear structural elements of the sculpture, consisting of about 70% of its total volume, lending to both the design and function of the sculpture, are made of locally sourced Bamboo. We found East West Bamboo Farm on www.bambooweb.info, which is in Amenia, NY, two hours from the city and 45 minutes away from Catskills where the work was presented. It was important to find locally grown bamboo, all of their bamboo is field-grown specimen size and harvested to order. Deville picked up ten seven-foot poles from Tony on a single trip upstate with a hybrid car.

Bamboo is a fast-growing, woody member of the grass family that can grow in a wide range of environmental conditions and self-propagates via rhizomes, reducing the need for human intervention and additional resources. Similar to mycelium, bamboo sequesters carbon in biomass and soil at a rate greater than most tree species. Project Drawdown calculates that bamboo sequesters up to 2.03 metric tons of carbon per hectare per year in comparison to 1 metric ton sequestered by a hectare of pine forest. The strength and resiliency of bamboo allow for its reuse many times over before the end of its working life. Once bamboo no longer serves its purpose as a material, the least environmentally impactful means of disposal is composting. Purchasing bamboo from local farms significantly reduces the carbon emissions from transport over long distances.

Deville started growing mycelium forms in the studio to develop a more intimate relationship with materials and processes and learn how to reduce the studio's footprints. The first bag of living materials he got was a gift from Kai Patricio and Louise Manfredi after a site visit to the mycelium lab at Syracuse University. For the mycelium molds, he reused the negative cavity of the vacuum-formed plastic from the discarded packaging of everyday objects such as batteries, glue sticks, light bulbs, etc. as a mold. The durability of these readymade vacuumed-formed plastics allows for multiple and repeated use in variations of colors and weights, which inspired the design. The mycelium with hemp substrate is very lightweight and crumbly so he combined it with pebbles and pigment to provide weight for the stabilizing base pieces.

Mycelium composite is produced by living fungi that require air, organic food, and moisture for its growth. The fungal spores added to the hemp substrate form hyphae, which grow together to form a stable, solid material that has many applications in art production and exhibition making. Mycelium composite is biodegradable in soil within a few months but home composting reduces the emission of methane through aerobic decomposition. The mycelium used for this project was purchased online from Ecovative www.grow.bio.

Material	Quantity	New/ Reused/ Reclaimed	End-of-working-life management	Notes on supply chain	Estimated Carbon Footprint
Mycelium and hemp substrate	20 lb	New	Biodegradable in soil or water within 90 days	Grow.bio	Negative
Bamboo poles	9kg	New	Potential for reuse, Compostable	Locally sourced	Locally grown = carbon sink. One hectare of bamboo absorbs about 17 tonnes of carbon per year
1 by 2 wood Pine	3.08 meters	Reused	Reusable, Recyclable	Repurposed	0.21 / 1 kg

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* In calculating the carbon footprint of the material components comprising K.I.S.S, we used the Idemat app, a sustainable materials selection app based in Europe for product designers (https://idematapp.com/). Depending on the scope of the LCA (life cycle analysis), the carbon footprint for materials typically includes emissions from transporting products to distributors and is therefore location-specific. Idemat measures the carbon footprint from cradle to gate and also includes end-of-life scenarios, meaning the emissions from transport are not included but the calculations are still regionally specific to a certain extent. The materials for K.I.S.S. were purchased or sourced in the USA, and even though carbon calculations do not accurately reflect the carbon footprint of products manufactured in the USA, the carbon calculations from Idemat provide a rough baseline for comparison among the different materials. As previously mentioned, the carbon footprint of materials, while important to consider when making material decisions for art production, is only one of many impact categories related to material consumption.

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