“Clean-Swap”

EMISSIONS VS PRODUCTION

Jan Ilukpitiya

25 TONNES

of CO2 Emitted in the Production of One (400mile range) Electric Car.

5 TONNES

of CO2 Emitted in the Production of One (400mile range) Combustion Car.

Global Warming is Still Increasing as Electric Vehicles, are Powered Through an Energy Grid That is Not Largely Made Up of Renewable Energy. Therefore Not (Zero Carbon Vehicles)

200,000 MILES

is Required to be Driven Over the Lifetime of a 400Mile Range Electric Vehicle to Produce the Same Amount of Emissions as a 400Mile Range Combustion Car Over the Same Distance.

90,000 MILES

is Required to Have Been Driven to Offset the Emissions of an Electric Car with a 125 Range in Comparison to a 500mile Range Conventional Car. (With the Average Range Over a Cars Lifetime Being 200,000 Miles.

%41

of the U.K. Grid is Renewable as of 2020

%28

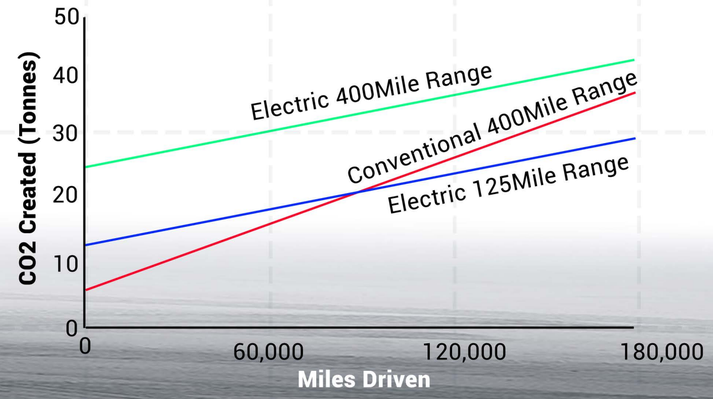
of the Worlds Energy Grid is Renewable as of 2020

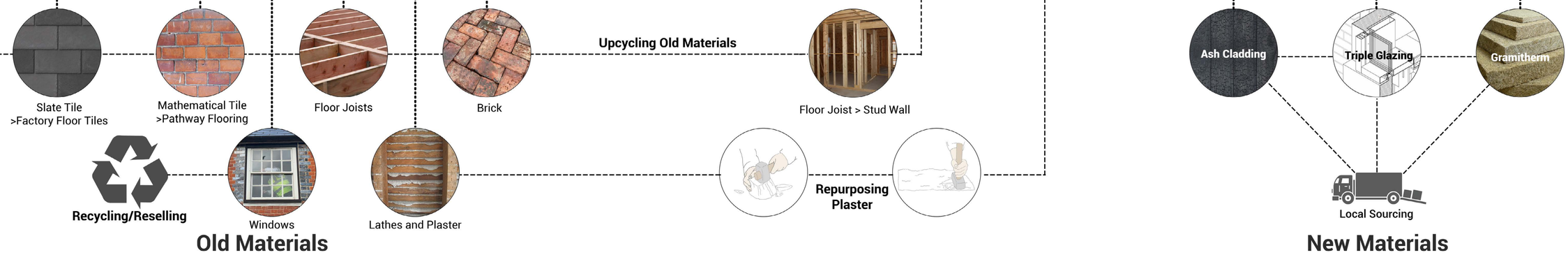
The world needs to stop pushing for a Fully Electric Future Before it has Sufficient Infrastructure or it will Worsten the Global Warming Crisis.

Convert Your Current Cars Instead!

%60

of the Worlds Energy Production is still Coal and Gas.
Mining Coal and Oil and Burning it is Adding CO2 into the Atmosphere That was Not Once There, Which is the Same for the Production of Hazardous Lithium Batteries





Old Materials

New Materials

New Sustainable Materials & Alternatives

Ash Cladding

+Locally Sourced Tree
+Dying Out Locally Due to Disease Therefore There is Plenty in Abundance
+Easy to Burn on Site
+Sustainable
+Low Environmental Impact Due to Trees Being Cut Down to Stop Disease Spread

Less Sustainable Alternatives=

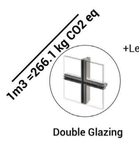
Larch Cladding

+Locally Sourced Tree
+Easy to Burn on Site
+Renewable
-Not Dying Out Locally

Triple Glazing

1m3 =415.6 kg CO2 eq

+High Thermal Efficiency Leading to Less Emissions Post Creation
+Long Lasting
+Sound Resistant
+Manufactured in Large Sizes



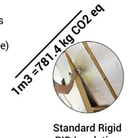
Double Glazing

+Less Emissions in the Creation Compared to Triple Glazing
+Can be Locally Sourced
-Thermal Efficiency is Worse Than Triple Glazing
-Not as Great Sound Resistance

Gramitherm

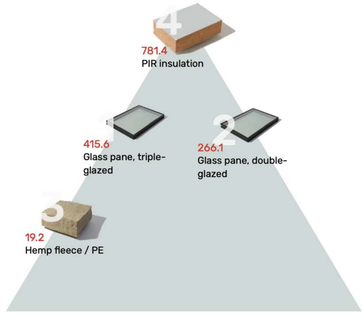
1m3 =19.2 kg CO2 eq

+Created From Meadow Grass Fibres
+High thermal efficiency
+Sustainable (1 Acre = 200m3 Insulate)
+Good Fire Rating



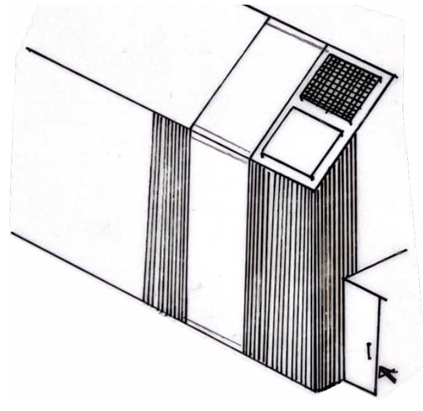
Standard Rigid PIR Insulation

-High Carbon Emissions in Creation
-Hard to Recycle
-Long Lifespan
-Toxic to Wildlife if Broken Down Incorrectly



| kg CO_{2} eq
| module A1-A3

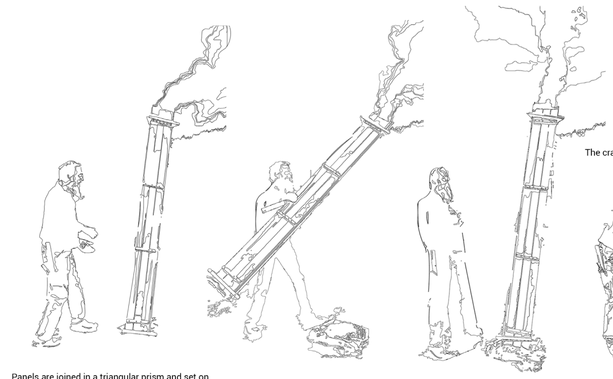
Your pyramid:
1,482.3 kg CO_{2} eq



Locally Growing Trees at a Radius of 30 Miles

-Larch
-Douglas Fir
-Ash
-Yellow Pine
-Pitch Pine
-Sitka Spruce

The craftsman then uses his hamer to pry the sides loose to allow the fire to burn the edges.



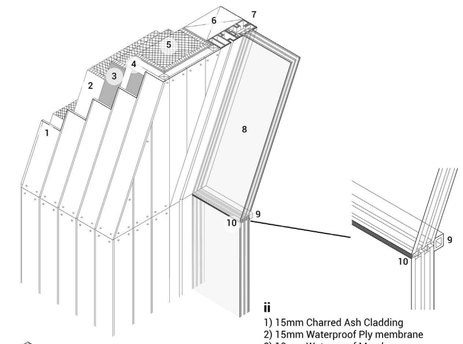
Panels are joined in a triangular prism and set on fire internally.
This process draws in oxygen from the bottom and accelerates the burning through a chimney like structure, burning what would be the exterior of the panels once taken apart.

The prism has been flipped around to allow for an even burn across the panels.

The craftsman uses his hammer to hit off the securing edges.

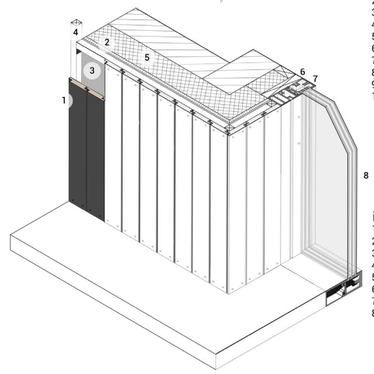
He then unravells the secondary wire ties, whilst allowing the prism to continue burning horizontally.

Then the prism is unravelled and laid out evenly on the worktable, the fire immediately suppresses itself and the wood is cooled further by a water sprinkler.



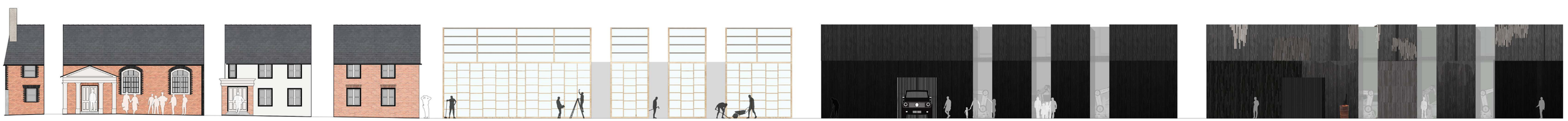
ii

1) 15mm Charred Ash Cladding
2) 15mm Waterproof Ply membrane
3) 10mm Waterproof Membrane
4) 20mm Timber Stud Framing
5) 110mm Rigid Insulation
6) 180mm Timber Truss
7) Aluminium Side Supported DGU Unit
8) Triple Glazing Pane
9) Aluminium Square Corner Profile
10) 10mm Structural Silicone



i

1) 15mm Charred Ash Cladding
2) 15mm Waterproof Ply membrane
3) 10mm Waterproof Membrane Sheet
4) 20mm Timber Stud Framing
5) 110mm Rigid Insulation
6)Timber Stud
7) Aluminium Side Supported DGU Unit
8) Triple Glazing Pane

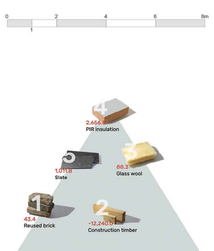


Lewes Quakers Meeting House (Present)

Stage 1 - Timber Framing and Water Resistant Membrane Coverage

Stage 2 - Combustion to Electric Car Conversion Centre

Stage 3 - 30 Years Time + Repairs



| kg CO_2 eq
| module A1-A3

Upcycling Existing Materials

Your pyramid: -8,439.8 kg CO_2 eq

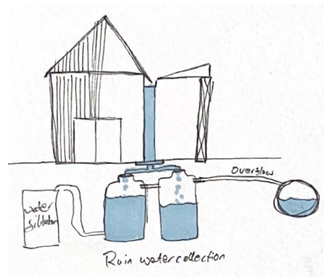
show result in pyramid ↑	reset calculation	Upcycling Existing Materials		m^2				
	material	group	impact / m3	volume [m3]		area [m2]	thickness [mm]	result
2	**Construction timber**	trae	-680.0 kg CO2eq/m3	18	m3	m2	mm	**-12,240.0 kg CO_2 eq/m3**
3	**Glass wool**	mineralsk	12.8 kg CO2eq/m3	6.9	m3	m2	mm	**88.3 kg CO_2 eq/m3**
4	**PIR insulation**	kunststof	781.4 kg CO2eq/m3	3.4	m3	m2	mm	**2,656.8 kg CO_2 eq/m3**
5	**Slate**	natursten	1367.3 kg CO2eq/m3	0.74	m3	m2	mm	**1,011.8 kg CO_2 eq/m3**
1	**Reused brick**	mineralsk	4.9 kg CO2eq/m3	8.85	m3	m2	mm	**43.4 kg CO_2 eq/m3**
								-8,439.8 kg CO_2 eq/m3

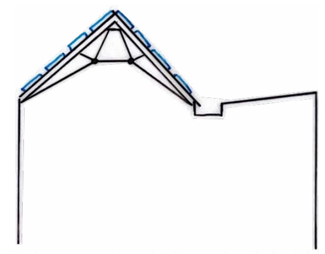
| kg CO_2 eq
| module A1-A3

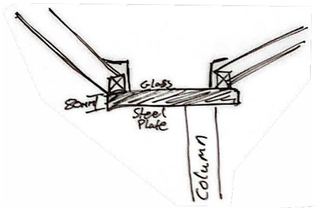
New Materials

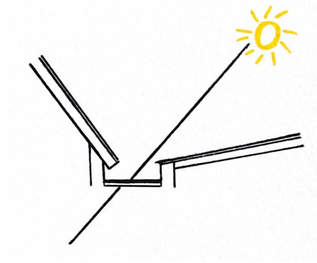
Your pyramid: 4,186.7 kg CO_2 eq

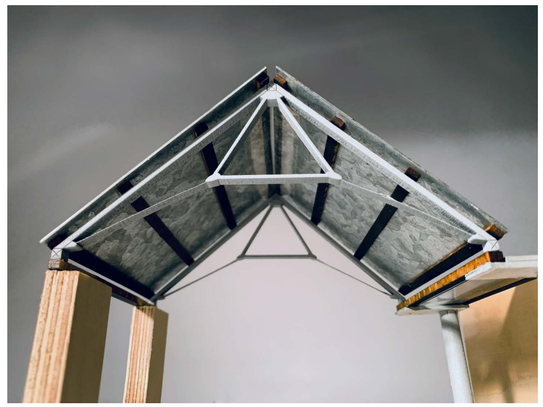
show result in pyramid ↑	reset calculation	New Materials		m^2				
	material	group	impact / m3	volume [m3]		area [m2]	thickness [mm]	result
1	**Glulam**	trae	-610.0 kg CO2eq/m3	0.40	m3	20 m2	20 mm	**-244.0 kg CO_2 eq**
2	**Plywood**	trae	-649.0 kg CO2eq/m3	7.94	m3	467 m2	17 mm	**-5,152.4 kg CO_2 eq**
3	**Hemp fleece / PE**	biobaseret	19.2 kg CO2eq/m3	35.20	m3	352 m2	100 mm	**675.8 kg CO_2 eq**
4	**Aerated concrete blocks**	mineralsk	180.0 kg CO2eq/m3	18.10	m3	181 m2	100 mm	**3,258.0 kg CO_2 eq**
5	**Paint, matte**	andet	2851.0 kg CO2eq/m3	0.03	m3	460 m2	0.076 mm	**99.7 kg CO_2 eq**
6	**Structural steel**	metal	8831.2 kg CO2eq/m3	0.13	m3	2.5 m2	50 mm	**1,103.9 kg CO_2 eq**
7	**Aluminium frame window**	komponenter	1172.7 kg CO2eq/m3	0.14	m3	13.9 m2	10 mm	**163.0 kg CO_2 eq**
8	**Glass pane, double-glazed**	komponenter	266.1 kg CO2eq/m3	0.79	m3	31.5 m2	25 mm	**209.6 kg CO_2 eq**
9	**Glass pane, triple-glazed**	komponenter	415.6 kg CO2eq/m3	3.04	m3	69 m2	44 mm	**1,261.8 kg CO_2 eq**
10	**PP roofing membrane**	kunststof	271.5 kg CO2eq/m3	0.26	m3	171 m2	1.5 mm	**69.6 kg CO_2 eq**
11	**Gypsum board**	mineralsk	169.6 kg CO2eq/m3	4.67	m3	467 m2	10 mm	**792.0 kg CO_2 eq**
12	**Concrete C30/37**	mineralsk	288.0 kg CO2eq/m3	6.77	m3	m2	mm	**1,949.8 kg CO_2 eq**
								4,186.7 kg CO_2 eq/m3

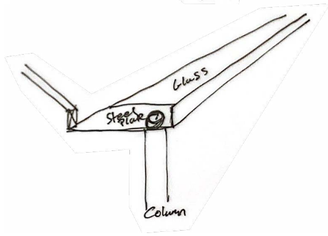


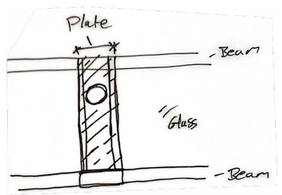


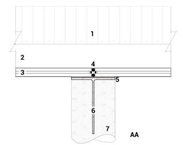




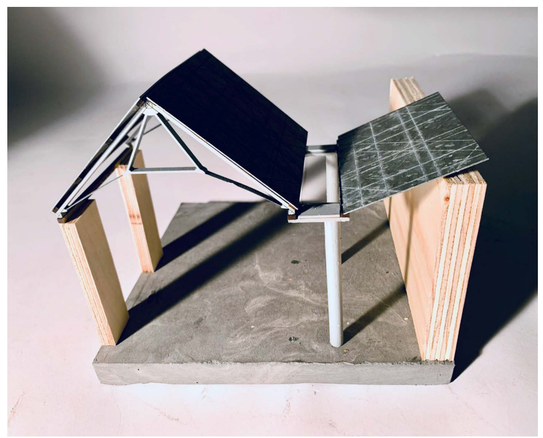


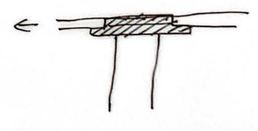


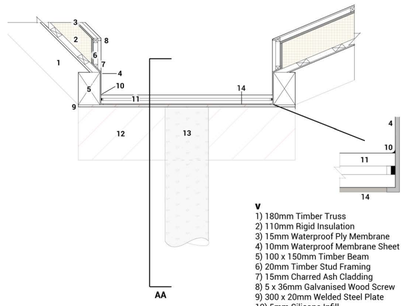




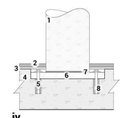
AA
1) 180mm Timber Truss
2) 100 x 150mm Timber Beam
3) Double Glazing Panel
4) 5mm Silicone Infill
5) 10mm Rubber Bed
6) 300 x 150mm T Steel
7) 200mm Concrete Column



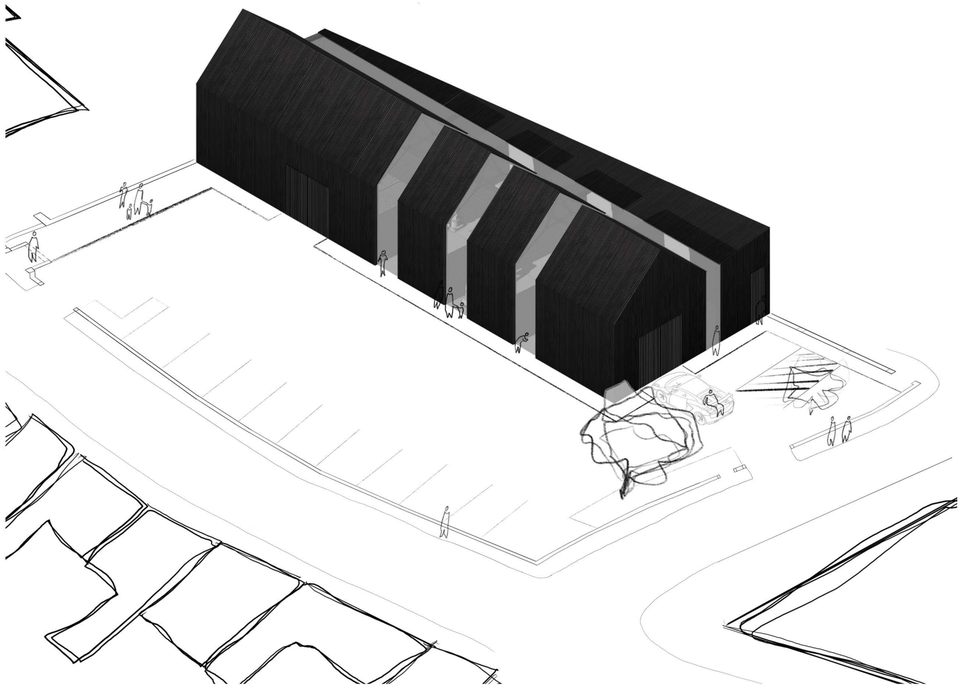




v
1) 180mm Timber Truss
2) 110mm Rigid Insulation
3) 15mm Waterproof Ply Membrane
4) 10mm Waterproof Membrane Sheet
5) 100 x 150mm Timber Beam
6) 20mm Timber Stud Framing
7) 15mm Charred Ash Cladding
8) 5 x 36mm Galvanised Wood Screw
9) 300 x 20mm Welded Steel Plate
10) 5mm Silicone Infill
11) Double Glazing Panel
12) 300 x 150mm T Steel
13) 200mm Concrete Column
14) 10mm Rubber Setting



iv
1) 200mm Concrete Column
2) 15mm Slate Tiles
3) 10mm Tile Adhesive
4) 150mm Concrete Setting
5) 100mm M12 Bolt
6) 300m Steel Plate
7) Plate to Column Welding
8) Epoxy (Metal to Concrete)



The project ‘Clean Swap’ addresses climate emergency and the future of converting combustion vehicles into electric by reusing the chassis, while the design introduces robotics into the process. The principles of circular economy were applied in the approach to the site’s existing materials by upcycling and repurposing the timber, tiles, insulation, and plaster. Embodied carbon, cradle to gate, was addressed in the calculated emissions of the existing materials on site vs the production of new materials, leading to the considered use of charred Ash Dieback, cut down due to disease, otherwise wasted, but used here as cladding and insulating through high thermal mass.