**HALATIONS**

**Abstract** -

Halation’s serve as generative solar installations, which seek to revitalise parabolic trough technology, though sculptural form and mechanical movement, both functioning to maximise potential solar capacity. The power produced by each Halation, is primarily utilised in the forms gentle sun synchronisation and defused lighting array, with excess diverted to the needs of intrigued wonderers. These mirage like manifestations of solar potential and artistic activation, seek to occupy remote extents of the site, as to incentivise individual exploration, ultimately functioning to expand and enhance our perceptual understandings of the Northern Nevada landscape, through a decentralised strategy for site activation.

**Technology** -

The base technology utilised in this design, is that of the Parabolic Trough; an extruded semi cylindrical structure that focuses sunlight onto a centralised heat absorption tube, situated at the forms radial axis, this in turn transfers its accumulated heat through steam or an oil based medium, that is then directed through a heat transfer turbine to generate energy.

Furthermore, this project will seek to utilise next generation trough material compositions, employing a polymer silver layer stack, instead of conventional glass based designs - this method is advertised to be 60% lighter, and 30-40% cheaper, both of which are in the interest of this design context.

(Breeze, P. (2016). *Solar power generation*. London, UK: Academic Press is an imprint of Elsevier, pp.p25-34.)

In regard to the specifics of my design - although a mechanised synchronisation with the sun is a common innovation utilised on commercial plants, the arch like form devised within this project has, to my knowledge, never before been communicated or manufactured, as I believe it would likely decrease total solar yield, though only within a minimal margin.

**Inputs** -

Depending upon the transfer medium most available, this design would likely require the input of a on site heat transfer turbine unit, in order to convert and supply energy.

**Prototype Output** -

Using this formula for a standardised parabolic trough operating at 24% efficiency, approximates potential output at 45-50 kWh/y per m2, therefore a prototype structure specified at a 1 meter trough diameter, and a 10 meter structural diameter, would equal 31.2 m2 of available surface area - translating to a potential yearly capacity of 1404 - 1560 kWh.

It should be noted that this does not account for the structures unique form, and therefore may incur subsequent deviations.

**Materials** -

The key materials utilised in the composition of the trough, include aluminium for the space frame, aluminium for the exterior shell, a steel central support beam, and polymer/ silver top coats for the reflective paneling. While ancillary materials include LED panels for the lighting, polycarbonates for light diffusion, and concrete (with rebar) for structural supports.

**Prototype Strategy** -

Evidently the structures depicted within the project renders are of immense scale and subsequent cost (both in materials and engineering), therefore if selected, I would prototype this installation, at a third of its initial scale - taking on a radial base of 5 meters with a 1 meter diameter trough.

Furthermore, this concept structure will require a significant degree of structural and mechanical engineering to ensure both public safety and general feasibility, therefore I would partner with a qualified engineer to generate a more refined design to be implemented on site.

**Conceptual Cost** -

Finally, due to its unprecedented form within the context of this technology, a price estimate for this structure would require a number of commercial quotes outsourced in a post covid climate - this includes but is not limited to, structural and mechanical engineering, material sourcing and manufacturing, cumulative transportation and labour of assembly, in addition to prefabricated components such as the heat transfer turbine unit. Subsequently, a definitive quote is hard to ascertain, though I believe could function within the margin of 15 000 - 25 000 USD.