Analysis of the Sustainability of Home for Life
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INTRODUCTION
Buildings account for 40 percent of an industrialized country’s energy use, while 60 percent of our time is spent indoors. Furthermore, homes offer us a delightful space to rest, live, and enjoy. Unfortunately, while we invest great amounts of time and energy in indoor environments, one third of them are “unhealthy.”

In this research project, by defining the term “healthy” for a home, the evaluation of four major components is considered: net energy usage, construction techniques, thermal comfort, and visual view. A thorough case study of the Home For Life house exemplifies innovative architectural design and building technology that would become a paradigm for future housing.

BACKGROUND
Architect: AART Architects
Location: Aarhus, Denmark
Completed: 2009
Total floor area: 2,050 sq. ft. (190m²)

Home for Life, now dwelled by the Simonsen Family, is one of the experiments by the developer Velux Group to reinvent the home with sustainability, renewability, and affordability from the design process to paid back period. In collaboration with AART Architects and Esbenkson Consulting Engineers, the home integrates interdisciplinary design innovations that supplement the holistic entity. Since its construction, the Home for Life has achieved much public and academic attention on the international level.

RATIONALE
A list of houses were categorized and ranked based on the judging factors below. Although each factor was weighted differently based on the goal of each project, we critically ranked that Home for Life would be the best case to provide a thorough framework for future homes to model.

Healthy indoor environment. Design Principles
Construction materials
Architectural design
Energy efficiency
Budget constraint

METHODOLOGY
A thorough framework for future homes to model.

DYNAMIC COLLABORATION
The flow of decision making is not hierarchical, but collaborative approach that aims to achieve the optimal solution. While Home for Life presents a holistic model that sets the standards for our future residential development, various parameters must be taken into account critically.

EMBODIED ENERGY
Embodied energy, in MJ/kg, measures the amount of processing energy required to create it from raw resources. While aluminum and metal alloys resist against high stress and are recyclable, their very high embodied energy would not be sustainable as the main framing material for residential dwellings.

LIVE
The Home for Life underwent a test for the Simonsen family, composed of two adults and three children. Two important conclusions for this experiment:
• Energy consumption greater than theoretical predictions, especially for heating.
• Energy production of solar cells is not sufficient to cover the home with sustainability, renewability, and affordability from the design process to paid back period.

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