Chapter 1

Sustainable development approach

In current social climate it is more and more important to develop in a sustainable way. Sustainable development is defined in the Brundtland report[**?**], quoting:
"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."
Sustainable development is achieved by looking at the whole life cycle of the product, reducing unnecessary expenses, use of material and energy as well as reducing the thrown away material. Also reusing materials will help.
For the All plastic High Altitude Observation platform the complete life cycle is taken into account. The main goal is to get the life cycle as long as possible and cheap sustainable production. A long lifetime gives a high efficiency of the production stage. The advantage of an all plastic vehicle is that a long life time can be achieved by using wear resistant materials. Furthermore a wide variety of plastics can be produced easily, in contrast with metals and metal alloys. The production techniques of these materials require low amount of material.
With battery technology improvement the amount of energy stored per weight is growing fast. This allows light weight batteries, using less material. Current developments in polymer solar panels are promising. Production of polymer solar panels can be much cleaner than the production of current solar panels. Currently used solar panels contain high amounts of rare metals such as galium, indium and selenium. Mining and production of rare metals is a polluting industry. Also the available amount of these rare earth elements is reducing[**?**][**?**] and therefore it is a good development to have alternative methods for energy production and storage.
Another approach of the sustainable development of the observation platform will be 3D printing. 3D printing is a production method that allows cheap and fast production of plastic structures. There is no excess material after printing parts. Connections can be made without riveting, while gluing or other connection techniques can be minimized. This can reduce the weight which reduces the required material, energy of production and energy during operation. Due to the relatively cheap production the product becomes available to a wider public.
During the operational life of the aircraft, sustainability is important. Which energy source is used for continued flight can have a big impact on the environment. The use of natural sources with low emission of green house gasses other harmful materials is preferred over polluting propulsion. A good example is solar power over jet fuel as an energy storage.