

BUILDING A COMPETITIVE SOLAR CAR



Challenge

ANU Solar Racing (ASR) is a student-run team which designs, builds and races a solar powered vehicle 3022km across Australia in the Bridgestone World Solar Challenge (BWSC), competing against over 40 cars from 25 different countries. To be competitive, the team must design and build a highly aerodynamically efficient chassis within the racing regulations' parameters. Being a student team with limited resources, it is not possible to produce multiple prototypes or conduct extensive physical testing, so **the team uses simulation to rapidly consider a variety of virtual chassis designs** before committing to a design for the final build. In a remote race across vast distances, ASR engineers carefully consider **trade offs between a need for reliability against the need for aerodynamic efficiency and weight minimisation** to remain competitive.

Solution

Since its inception six years ago, this is ASR's third car but the first time the team has used Ansys CFD and FEA simulations to consider these important design trade offs. Ansys simulation results gives the team useful performance insights and enough data to have confidence to commit to important design decisions. In this design cycle, **Ansys CFD helped the team switch from a 4-wheel to 3-wheel chassis to reduce aerodynamic drag. Ansys FEA also helped to design the front suspension H-piece, helping test multiple different design iterations before committing to manufacturing.**

ANSYS Advantage

*"For the first time, Ansys has enabled us to simulate our solar car's performance and thoroughly evaluate our aerodynamic designs before we commit to manufacturing. We used Ansys software extensively to conduct FEA on important components of the vehicle, such as our suspension, brakes and steering. The **insights from these FEA simulation results empowered us to optimise our parts, producing parts that were lighter and more easily manufacturable.** Being able to utilise a professional-grade engineering tool such as Ansys has not only greatly increased the accuracy and speed of our development, but also provided exposure to our team members in best practice use of FEA & CFD in industry."*

Robin Hodda, Mechanical Sub Lead, ANU Solar Racing

