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Technical Information Document

1. Background:

Efficycle competition has focussed on technical improvements by introducing new rules, guidelines and performance targets for the participants year on year. Previous seasons were based upon the particular themes as below:

- Efficycle 2015: **Light Weight Season**
- Efficycle 2016: **Build Quality Season**
- Efficycle 2017: **Drive Excellence Season**
- Efficycle 2018: **Dynamic Resilience Season**

2. Introduction:

In the world of ever increasing fuel prices and road congestion, it is time to make the mobility concept of Efficycle commercially viable. Considering a real world application of Efficycle on Indian Roads, the engineering students are being given a challenge to conceptualize, design and fabricate a vehicle which is not restricted to being a track prototype, but it can be used for personal and commercial mobility.

Efficycle 2019 i.e. Season-10 is aimed to have implementation of advance technologies and to have more user friendly features in the vehicle called **Advance Efficycle**. This will include technology & features which are pragmatic enough to be introduced on road having better stability, manoeuvrability and rider safety & comfort. The requirement of **Advance Efficycle Format** will be explained further in this document.

For the purpose of competition, teams are assumed to be working for a fictitious organization that aims to deliver a sustainable mobility solution for short distance commute. The vehicle will be subjected to tests and evaluations based upon the conditions encountered in real life applications.

Whereas, the previous version of Efficycle will continue with similar rules, called **Regular Efficycle Format** in this season.

3. Idea behind 2 different formats of Efficycle vehicle:

Efficycle vehicle was conceptualized initially to make it an eco-friendly future mobility solution for India. In this direction, the competition has been proved to be a platform for young engineering students to learn automotive engineering skills by designing and fabricating a 3-wheeled, 2-seater, human cum electric powered vehicle. The teams have been bringing different type of innovations implemented in the vehicle. Now, it is felt that some of these innovations have become the basic need of an efficycle to utilize an efficycle in real world for personal and commercial mobility applications.

For making efficycle a feature & technology rich vehicle, it is believed that an improved version of vehicle is desirable which could include these features & technology as standard requirements of vehicle. Hence the new rules are being introduced for vehicles in "**Advance Efficycle Format**". The institutes, which have been participating in previous seasons of competition, are appealed to accept this new challenge and register for "**Advance Efficycle Format**".



"SEASON-10"

However, to keep the participation convenient and cost viable for new participants, the previous version of vehicle is continued in this season in form of "**Regular Efficycle Format**".

4. What's New in Advance Efficycle Format?

- Better Exterior & Interior for **improved aesthetics**
- Improved level of **Occupant Protection Features**:
 - Body enclosures
 - Roof Protection
 - Floor Panels
 - Lower ground clearance of better stability
- Introduction of **electronic features for information to riders** e.g. speedometer/rpm indicator, battery level indicator and other tell-tales.
- **Increased power/weight** ratio target by reduction of weight such as use of alternate material for frames, exclusion of heavy lead-acid batteries and other weight optimization techniques.
- Energy Regeneration Techniques
- Usage of more **safety features** such as headlamps, brake lights, turn indicators etc.
- **Demonstration of futuristic technologies** like Artificial Intelligence, Internet of Things, Electronic Controls, Use of GPS based systems, Parking Assists, Collision Avoidance Systems, Anti-theft systems and other smart technological developments etc.

5. How "Advance Efficycle Format" is different from "Regular Efficycle Format"?

- More Challenging to Participants
- Opportunity to showcase innovations in futuristic technology and this also adds to teams score in event.
- More freedom in vehicle design (frame and related parameters)
- Better Dynamic Performances
 - Speed and Acceleration Targets
 - Grade-ability Targets
 - Improved braking performance
- Mentor allocations after team registrations
- Separate Evaluation from "Regular Efficycle Format"
- Separate Awards for "Advance Efficycle Format"

For any enquiry, please write to efficycle.technical@saenis.org

Efficycle Technical Committee