Efficycle’ 2021

Q & A Session : 2

Date : 28.06.2021
Time : 6:00 PM ~ 7:00 PM
Agenda...

- Event Format
- Some FAQ’s from the technical team
- About the car maker
- Live session with the teams & mentors
Event Format...

Physical Event
- Physical Model
- Technical Inspection at College Level & at Event Site
- Static Events
  - Design, Cost, Business Plan, CAE
- Dynamic Events
  - Acceleration, Brake, Grade, Utility

Virtual Event
- Virtual CAD Model
- Virtual Technical Inspection of CAD Model
- Package-1
  - Project Plan, CAD, DVP, DFMEA
- Package-2
  - CAE, Subsystem Design, B Plan, Cost

Season 12
FAQ’s : Technical
Q. 1  
What are the Format’s planned in Efficycle 2021?  
What is the Difference in Specification?

Answer: 3 Formats are planned in Efficycle 2021, details are as follows:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Conventional Effi (3W Hybrid)</th>
<th>Advance Effi (3W Hybrid)</th>
<th>Advance Effi: (4W Effi-Qu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team Size &amp; Configuration</td>
<td>Team Members = 13;</td>
<td>Team Members = 13;</td>
<td>Team Members = 13;</td>
</tr>
<tr>
<td></td>
<td>Min: Electronics/Electrical = 3</td>
<td>Min: Electronics/Electrical = 5</td>
<td>Min: Electronics/Electrical = 5</td>
</tr>
<tr>
<td></td>
<td>3/4 year students = 3</td>
<td>3/4 year students = 3</td>
<td>3/4 year students = 3</td>
</tr>
<tr>
<td></td>
<td>Faculty Advisor = 1</td>
<td>Faculty Advisor = 1</td>
<td>Faculty Advisor = 2</td>
</tr>
<tr>
<td>Human Power</td>
<td>Separate for both drivers</td>
<td>Separate for both drivers</td>
<td>- NA -</td>
</tr>
<tr>
<td>Seating</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Steering</td>
<td>Use of Handlebars</td>
<td>Use of Handlebars</td>
<td>Use of Handle Bars / steering wheel etc.</td>
</tr>
<tr>
<td>Suspension</td>
<td>Rigid</td>
<td>Rigid</td>
<td>Double A-Arm ; 50mm travel</td>
</tr>
<tr>
<td>MotorPower</td>
<td>600W</td>
<td>600W</td>
<td>600 W ( Rated )</td>
</tr>
<tr>
<td>Battery Specs</td>
<td>48V, 35Ah max</td>
<td>48V, 35Ah max</td>
<td>48V - 50Ah max</td>
</tr>
<tr>
<td>Battery Type</td>
<td>No restrictions</td>
<td>Other than Lead Acid (Li-ion, Li-Po etc)</td>
<td>Lithium Ion ( LFP Chemistry )</td>
</tr>
<tr>
<td>Vehicle Weight</td>
<td>150Kg</td>
<td>125Kg Max ( High Power / Weight Ratio )</td>
<td>169Kg</td>
</tr>
<tr>
<td>Exteriors</td>
<td>Floor, rain protection, body panels/ enclosure</td>
<td>Floor, rain protection, body panels/ enclosure</td>
<td>Floor, rain protection, body panels/ enclosure</td>
</tr>
<tr>
<td>Interiors</td>
<td>Dash Board, Speed/Odometer, Battery Indicator</td>
<td>Dash Board, Speed/Odometer, Battery Indicator</td>
<td>Dash Board, Speed/Odometer, Battery Indicator</td>
</tr>
<tr>
<td>Lightings</td>
<td>Brake Light, Headlamp, Turn Indicators</td>
<td>Brake Light, Headlamp, Turn Indicators</td>
<td>Brake Light, Headlamp, Turn Indicators</td>
</tr>
<tr>
<td>Material</td>
<td>Steel and Non-steel both</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Features</td>
<td>Basic</td>
<td>Cyclo-computer ; Speed Alert System (SAS) , Reverse Parking Assist System (RPAS), Driving Range Info , Adjustable Headlamp , Seat Belt Reminder</td>
<td>Cyclo-computer ; Speed Alert System (SAS) , Reverse Parking Assist System (RPAS), Driving Range Info , Adjustable Headlamp , Seat Belt Reminder</td>
</tr>
</tbody>
</table>
| New Additions                 | 1. BMS (Optional)  
2. Interiors and Exteriors same as advance category  
3. Pedal Assist System (Optional) | 1. BMS (Mandatory)  
2. Safety and driver assistance features like navigation, anti-theft mechanism  
3. Pedal Assist System (Optional)  
4. Suspension System  
5. Safety and driver assistance features like navigation, anti-theft mechanism  
6. Pedal effort reduction system (optional) | 1. BMS (Mandatory)  
2. Energy Regeneration (Mandatory)  
3. Pedal Assist System (Mandatory)  
4. Suspension System  
5. Safety and driver assistance features like navigation, anti-theft mechanism  
6. Pedal effort reduction system (optional) |
Q. 2

Is Effique a Full Electric Vehicle?

Answer: No, it is a Bio-Hybrid Vehicle → It must consist of an Electric Powertrain assisted with Pedals enabling three different Drive Modes.

- The powertrain should run by any of the three methods:
  a) manually thru pedals (for emergency maneuvering of vehicle)
  b) electrically thru motor
  c) manually thru pedals assisted by the motor also known as pedal assist.

- All three modes are mandatory.

THE BEST OF TWO WORLDS

The Bio-Hybrid combines the freedom and agility of a bike with the driving stability and weather protection afforded by a compact car. Human power and electric motor are conjoined in an innovative and eco-friendly drive system designed for the city environment.
Q. 3  What is Energy Regeneration ? Is it Mandatory for Effi-Que ?

Answer: Energy regeneration is mandatory for Effi-que.
· Any nature of energy regeneration is mandatory.
· It should be a working concept. It should power an accessory, charge the battery, brake the vehicle etc.
· One Possible Example of Energy regeneration method during De-Acceleration is mentioned in below image:

![Diagram of Motor, Generator, and Transmission]

Q. 4  To Whom Students shall contact in case of Query ?

Answer: There are Separate Teams in Organizing committee of Efficycle.

For Registration, Schedule, Payment etc. → please contact efficycle.teams@saenis.org

For Rulebook related, technical concept related → please contact efficycle.technical@saenis.org
Q. 5  Is students from electronic mandatory. If yes then what is least number ?

   Answer: Student from any branch can participate, No restriction on that part

Q. 6  Are we supposed to use only DRUM/DISC BRAKES only ?
       or Can we implement any other breaking systems like electromagnetic brakes which are frictionless brakes ?!

   Answer: Any sort of innovation can be introduced by the students but it should be working and an effective concept.

Q. 7  can we please get a tentative date for 1st evaluation and any detail on package1?

   Answer: 20th July is the tentative date by which the mentors and the package 1 details shall be shared.

Q. 8  Sir the dates mentioned in the rulebook are fully applicable to physical event ?

   Answer: Revised schedule and deadline will be shared through the social media handles

Q. 9  Will we be taught Carmaker from the beginning or do we need to know the prerequisites of MATLAB?

   Answer: Sufficient training from the very beginning will be organize.
       Matlab is a different software no such pre-requisites are needed.

Q. 10 Is the pedal assist system only the regeneration system?
       Or is proportional control of the motor through pedals also considered as pedal assist?

   Answer: Pedal Assist is just the combined effort of motor + pedal on to the driving shaft / wheels.
       It is not a regeneration system. It is basically range extension system or driver effort reduction system in simple words.
Q. 11  Suspension for Effique?
Answer: Atleast 50mm travel; Double A-Arm Suspension system is mandatory for effique.

Q. 12  Please clarify the fee details. Do we need to make phase 2 payment also?
Answer: No need to make Phase 2 Payments. Please check the revised fee details as per the virtual event format.

Q. 13  Are Doors compulsory?
Answer: Any sort of enclosure is mandatory it can be doors/ permanent panels etc

Q. 14  The rulebook states that the controller is with pedal assist. What exactly does this mean?
Answer: It means the inputs of pedal effort ring sensor positioned near pedals is supported by the controller. Additionally the regeneration part while the motor is running is also supported by the controller.

Q. 15  Please clarify the evaluation procedure in virtual mode?
Answer: A detailed evaluation procedure shall be shared very soon on the social media handles. Tentatively by 20th July.

Q. 16  Sir do we have to add electric reverse or mechanical reverse gear?
Answer: Both because if the battery dies vehicle shall remain maneuverable.
Q. 17  where we can have stimulation software for our vehicle?

Answer: Carmaker will be the simulation software for which licenses and necessary workshops shall be arranged.

Q. 18  In the energy regeneration dept. my teammates have found a way which is not there in the rule book. So, are there any restriction on those methods?

Answer: No restriction on energy regeneration method. But should be a practical and working concept.

Q. 19  Is pedal assist system provided with the motor kit or we have to use sensors by ourselves?

Answer: Had it been a physical event then Yes it was part of the new kit.

Q. 20  Can you say about the wheel specifications sir, like size and its parameters?

Answer: It should meet the dependant dimensional requirements like ground clearance etc.

Q. 21  Is there any restrictions on softwares to be used for 3d modelling and simulation?

Answer: No restrictions but evaluation / virtual simulation will be done on the car maker.

Q. 22  If the doors are compulsory Then what about width. I mean how we will calculate width (open doors) or (closed doors)?

Answer: Closed Doors
Q. 23 They said that we need to submit a video of the virtual video, so should we place the vehicle in virtual environment and create a video or what exactly does it mean?

Answer: Yes in virtual environment for static loadcases. Eg. For CAE Crash analysis. Dynamic Virtual simulation video will taken through Car maker.

Q. 24 Do we have any prohibition regarding the integration of motor with gear system?

Answer: No restriction.

Q. 25 can we use joy stick type steering? any steering restrictions?

Answer: No restriction.

Q. 26 Is there is thing like the efficiency of the regeneration system is measured?

Answer: It is basically dependent on how much energy is being generated divided by the usable energy.
About Car Maker
CAR MAKER – Our New Knowledge Partner

- Car Maker is a simulation software which is being used to develop applications in the fields of Autonomous Vehicles, ADAS, and Vehicle Dynamics Powertrain.

- CarMaker is a simulation solution specifically developed for testing passenger cars and light-duty vehicles.
ACADEMICS APPLICATION OF CARMAKER

CarMaker used by engineers for various aspects as follows:

- Vehicle Parametrization,
- Optimization,
- Visualization and to simulate
- Control hardware.

APPLICATION OF CARMAKER

CarMaker simulation software currently support teams in these racing series.

- Formula SAE Combustion, Hybrid & Electric,
- SAE BAJA,
- SAE Supra,
- Shell Eco Marathon
THANKS !!!