We will be returning to IN-PERSON ASME EFx® events in academic year 2022-2023! EFx events will be IN-PERSON, locally organized throughout the world and several EFx events will include our ASME competitions. Please visit the ASME E-Fest website for an updated list of events at https://efests.asme.org/. Events will be added as they are confirmed.

ASME will ALSO continue to host our two signature FULLY virtual events: E-Fest Careers (Nov. 12, 2022) and E-Fest Digital (March 25, 2023).

We encourage students, competitors, and faculty members to take advantage of the learning experiences provided by both our competitions and other digital offerings throughout the year.

Not all EFx events will have every competition available. Check that SDC is available at that event before registering.

Official responses to questions supersede original competition statements as well as any earlier question responses where there is contradiction. The questions are numbered sequentially as responded to, where Answer 1 is the earliest response.

Information about the ASME E-Fests can be found at: efests.asme.org

(Questions will answered about the 2023 ASME SDC until February 1, 2023)

Q&A Update February 6, 2023

Question 12:

- We were wondering if the ramp would be cut so that it is flush to the ground and to the loading platform. Or if the edges would be uncut and there would be bumps.
- If not, could you tell us how thick the wood, be. So that we know how large of bump the vehicle would have to clear

Answer 12:

- The edges may be uncut, teams should design for a possible small bump when entering the ramp and transitioning onto the unloading platform.
- The ramp will be constructed out of material between ¼”-1” thick, and devices should be designed to handle modest uneven surfaces.

Question 11:

- I have a question regarding the rule stating we are free to manipulate the robot in the loading area.
- Would this include allowing us to toggle a switch to enable battery charging as an alternative to a diode?

Answer 11:

- Competitors are only allowed to manually orient the device towards the wind/solar energy sources in the loading zone.
- Manually “operating” the device, such as toggling a switch to enable a function, is not allowed. The device must be able to charge on its own.

Question 10:

- Does the sizing factor pertain to both the initial round and the elimination round? The rules say that only the elimination round takes the sizing factor into account -- besides the tie breaker. However, this would make each round have different constraints and each round is its own type of competition, where the first focuses on weight deposited only, and the second focuses on sizing, weight deposited, and the energy source factor. Are we understanding the rules correctly?

Answer 10:

- Yes, that is correct. The initial rounds use the device sizing as a tie breaker only. The elimination round uses the sizing box factor directly in the scoring. The team should design their devices to be competitive across all rounds.

Question 9:

- Does the charging of 1.2 Volt AAA battery using external power source (battery, capacitor...) come under non-propelling action?
- What is the timeline of the competition? What are the submission dates and when is final competition?
- An additional battery can be already charged to use for non-propulsion purposes like Weight unloading mechanism, steering etc. but can it be used to charge my AAA battery also, during the run??

Answer 9:

- Any charging of the AAA battery connected to the propulsion system must be accomplished using wind/solar energy. Using any other external power source to propel the device is disallowed.
- Competition dates will be posted by ASME as they are confirmed. When dates are confirmed the competitors will be contacted and given the specific dates when the optional preliminary submissions will be required. (The design presentation will be 4 weeks before the competition, and the video of device operation will be 2 weeks before the competition)
- No.

Question 8:

- How many maximum members can participate in the competition?
- Can we use anything else AAA battery for the propelling purpose?

Answer 8:

- See General Rules #1 on the 2023 SDC competition document:
    - "Students participating in the competition must be undergraduate engineering students (any engineering discipline is allowed) and must be ASME student members. There is no limit on the number of students on a team or the number of teams from a school. Each student may only participate on one team (contribute to one device) – participants from schools fielding more than one team will be asked to affirm this at the competition."
- The allowable energy sources for propulsion purposes is the wind energy, solar energy, and a single rechargeable AAA battery provided to the team by ASME at the competition. Additionally, the use of mechanical energy is allowed for vehicle propulsion *if it is generated by the solar/wind energy collected*, however teams may not use pre-loaded springs or weights (including the weights being carried to the unloading platform), or initially compressed gas to propel the device.

Q&A Update January 11, 2023

Question 7:

- Can secondary power source (battery, capacitor, mechanical) be used to automated expansion of device, given that we would not be using it to propel the device anytime during the run?
- Can we leave a part of the device at unloading platform considering it to be part of payload?
- Can we charge our power sources (AAA battery and additional sources) multiple times during the 15 minutes round using solar and wind energy?

- Will the charging time of power sources using solar and wind energy also be counted in 15 minutes round?

Answer 7:

- Yes, this power source must be separate from the propulsion system. Also see Q&A #3 regarding expansion options.
- No, the entire device must make the trip to the unloading platform and return to the loading area to earn points.
- Yes
- Yes

Question 6:

- Is it possible that we can use circular weights? Are there any dimension limitations to the weights? Is there full freedom for weight design and use?
- Can we have a charged battery on our device for non-propulsion purposes at the initial stage?
- Does the automated dumping system fall under the propulsion segment of the device? Can we use a secondary battery for the automated dumping system?
- Does having no stored energy at the initial stage apply over the batteries used for non-propulsion purposes as well??

Answer 6:

- Yes, no (except weights must fit within the sizing box), yes.
- Yes
- No, automated weight removal is a control function, not propulsion. Teams can use the secondary battery for the weight dumping feature.
- No, the non-propulsion battery may be charged at the start of each stage.

Q&A Update December 15, 2022

Question 5:

- We are allowed to use an additional battery for “control purposes” but “not to propel the vehicle.” I was wondering if steering an unpowered wheel counts as control or propelling? As in, the back wheels are being driven but a singular unpowered front wheel is used to steer. Can the motor steering be powered by the additional battery or should it be powered by the main rechargeable battery?

Answer 5:

- Yes, provided that the battery controlling the unpowered wheel is not connected to the propulsion system (i.e. the battery is incapable to direct energy to the propulsion functions.

Question 4:

- How long is the "sufficient time" [when charging batteries]?
- How does the referee judge that "the devices contain no stored energy to propel the vehicle other than the AAA battery"?
- How do you define the term "no stored energy"? In the case of batteries like LiPo or other batteries, if it is completely discharged, it seems to be unusable. Therefore, it is recommended that the users shouldn't keep the charging level too low.
- In the competition, each vehicle will contain one AAA 800mAh battery + additional battery for control purpose + charged battery from solar/wind source. Is this correct?
- In the case that two teams use the same communication protocol (for example RF), what if the interference happens? What are the judges' actions?

Answer 4:

- Please refer to Answer 3.
- During initial device check-in, teams will be asked to demonstrate that there is no power stored on board when the AAA battery is disengaged from the device at the beginning of the round.
- Fully discharging batteries can be an issue. Teams need to determine energy storage options that will work for this competition.
- All teams will have the same AAA battery, and can provide their own control battery that doesn’t propel their device, but the method of energy storage of the collected solar/wind energy is up to the team.
- Please refer to Rule 27. If a judge believes a team intend to interfere with another team, that team will be disqualified from competition. It is in every team’s best interest to ensure that their device/controller communication method is secure.

Question 3:

- Will we be provided unlimited charging time during the initial round?
- To confirm batteries will be fully charged at the beginning of a round.
- Do we have to store all the batteries we will use in the sizing box with the robot or just put them in the sizing box for storage?
- Will any additional information be given on the ramp (thickness)?
- Are we allowed to add storage to the unloading zone? (To store liquid for example)
- Are we able to manually activate mechanisms to expand the robot? (For example, removing a pin or undoing a latch?)

Answer 3:

- Each team will be given a new, charged battery at the start of competition check-in. Teams will have more than an hour to confirm that their battery is fully charged. Similarly, between rounds teams will have more than an hour to recharge.
- Yes
- Everything that is used on your device should be stored in your sizing box, including all batteries. The battery may be disengaged from the robot while in the sizing box for inert storage purposes. However, all batteries must be stored in the sizing box when not in use throughout the duration of the competition.
- This question is unclear. The unloading platform must be empty at the start of the competition, and all deposited weights removed as soon as they are deployed and measured. The unloading zone is shared real estate on the field, so neither the device nor the team may deploy objects other than the weights.
- Related to Rule 7: “Device expansion must occur under its own power – this may involve preloaded springs or weights.” A simple action like pulling a pin may be used to expand the device.

Question 2:

- Is there any standard on the weights that are used? Standards being size, shape, and/or weight.
- Are we able to reset mechanisms manually while in the loading/charging area? (without being deducted any points)
- What is the material/condition of the floor the robot must traverse?

Answer 2:

- Teams may create and use whatever weights best suit their device.
- Teams will be allowed to reorient their devices to be positioned toward the energy sources and load (reload) weights within the loading area, however manual resetting that adds energy is not permitted. Devices must be capable of operating completely under device power, not with force and control directly provided by a team member.
- Devices should be capable of traversing typical flooring: concrete, tile, wood, carpet. The floor will be as level and smooth as possible. See question 1 regarding ramps.

Q&A Update November 22, 2022

Question 1:

- Does a device that catches the wind from the fan and directly uses that wind to propel it count as having wind energy?
- What happens if the weights are automatically unloaded, but then they fall off of the unloading zone?
- How are the ramps and unloading platform going to be manufactured?

Answer 1:

- Devices that are directly propelled by the wing count as having wind energy
- Weights must remain on the unloading platform to count
- The ramps and unloading platform will most likely be fabricated from unfinished wood. They will be relatively smooth, and will meet the dimensions given in the competition rules. Devices should be able to function on a variety of surfaces and reasonable transitions from the ground to the platform.