

SHELL ECO-MARATHON



Green Gears

What is Shell Eco-Marathon?

The Shell Eco-marathon is a global competition that challenges student teams to design, build, and drive the most energy-efficient vehicles possible. Participants aim to travel the farthest distance using the least amount of energy.



Our Target

Participating in the Shell Eco-marathon offers an unparalleled opportunity to innovate in the field of sustainable transportation and contribute to the development of energy-efficient technologies. Green Gears aims to achieve an ultra-efficient fuel electrically powered. Our goal is to create an impact at the regional competition to participate in the global finals. With an approximate number of 300 teams participating, Shell Eco-marathon attracts a variety of sponsors, including major corporations, technology companies, automotive firms, and educational institutions.

1 Executive Summary

In the span of 8 months, Green Gears will build an ultra-aerodynamic car inspired by Formula 1 racing, aiming to be a strong contender in the Shell Eco-marathon Asian regional competition. Our vehicle will feature a custom-designed electric vehicle optimized for energy efficiency, delivering sufficient horsepower and torque. The lightweight body will be constructed from carbon fiber, incorporating innovative use of date pits and palm tree fibers. Moreover, it further enhances the structural integrity and strength of our car body using widely abundant natural resources. This project will require substantial materials and support, including high-quality composites, engine components, access to wind tunnel testing, and financial backing from sponsors and university grants.

2 Background

2.1 Requirements

The requirements for the Green Gears Efficiency project can be categorized into several key areas: technical, material, financial, and support requirements. Here's a detailed outline:

Technical Requirements:

1. Vehicle Design:

- Ultra-aerodynamic body inspired by Formula 1.
- Integration of date pits and palm tree fibers into the carbon fibre body design for cultural representation and innovation.
- Compliance with Shell Eco-marathon technical regulations and safety standards.

2. Engine:

- Upgraded electrical motor.
- Ample battery capacity.
- Sufficient horsepower.
- Lightweight and compact design to complement the aerodynamic body.

3. Chassis and Suspension:

- Lightweight and strong chassis design to support the vehicle structure.
- Efficient suspension system to enhance performance and handling.

Material Requirements:

1. Body Materials:

- High-quality carbon fiber for the vehicle body.
- Date pits and palm tree fibers for innovative material integration.

2. Engine Components:

- Power inverter.
- Lithium.
- Electric motor.
- Transmission.

3. Other Materials:

- Lightweight alloys or composites for chassis and suspension.
- High-efficiency tires and low-resistance bearings.

Finances

1. Funding Sources:

- Financial support from university grants.
- Sponsorship from companies and organizations.

Support Requirements:

1. Technical Support:

- Access to engineering labs and workshops for design and assembly.
- Guidance and mentorship from faculty advisors and industry experts.

2. Testing Facilities:

- Access to wind tunnel testing for aerodynamic validation.
- Engine testing facilities for performance tuning.
- Race track to test car validity.

3. Logistics and Administration:

- Project management and coordination support.

- Marketing and outreach support for sponsorship and publicity.

3 Proposal

3.1 Vision and Goals

To pioneer the future of sustainable transportation by designing an ultra-aerodynamic, culturally innovative vehicle that not only excels in sustainability, but also showcases the potential of integrating local materials and engineering excellence, inspiring a new generation of eco-conscious engineers and driving global progress towards greener automotive technologies.

This vision underscores the project's commitment to:

1. **Innovation:** Pushing the boundaries of vehicle design and engineering to achieve unprecedented levels of sustainability.
2. **Sustainability:** Utilizing environmentally friendly materials and promoting sustainable practices within the automotive industry.
3. **Cultural Representation:** Incorporating unique local materials, such as date pits and palm tree leaves, to symbolize the UAE and highlight the importance of cultural heritage in technological advancements.
4. **Global Influence:** Setting a benchmark in the Shell Eco-marathon competition, inspiring other teams and stakeholders to prioritize energy efficiency and sustainability in their projects and products.

3.2 Deliverables

Why You Should Sponsor Green Gears:

1. Innovation and Technology Advancement:

- Sponsoring Green Gears aligns a company with cutting-edge innovation and sustainable transportation technologies. This demonstrates the sponsor's commitment to forward-thinking solutions and industry leadership.

2. Brand Exposure and Positive Publicity:

- The Shell Eco-marathon is a globally recognized event, offering extensive visibility for sponsors organized by one of the world's leading companies in oil and gas production and distribution, manufacturing, and innovations in engineering. Sponsorship provides exposure through media coverage, social media, competition events, and promotional materials.

3. Corporate Social Responsibility (CSR):

- Supporting a project focused on sustainability and education enhances the sponsor's CSR profile. It shows dedication to environmental stewardship, community engagement, and fostering future talent in STEM fields.

4. Talent Acquisition and Development:

- Engaging with a student-led project allows companies to connect with and potentially recruit bright, motivated future engineers. This sponsorship also provides opportunities for mentorship and internships, building long-term relationships with emerging talent.
- This opportunity opens doors for sponsors to create connections with ambitious, persevered, and dedicated students that may later serve as strong potential candidates at your company.

5. **Market Differentiation:**

- Associating with an innovative, sustainable project helps differentiate the sponsor in the marketplace, appealing to environmentally conscious consumers and partners.
- Affiliation with diverse sources of production will enhance the brand exposure and prove to the world sponsor's support towards efficiency and their promotion of the youth

6. **Networking Opportunities:**

- Sponsorship facilitates connections with other industry leaders, academic institutions, and potential business partners through events, presentations, and collaboration opportunities.

Deliverables to the Sponsor:

1. **Brand Exposure:**

- **Logo Placement:** Prominent placement of the sponsor's logo on the vehicle, team uniforms, banners, and promotional materials.
- **Media Coverage:** Inclusion in press releases, published articles, social media posts, and project updates.

2. **Marketing and PR Opportunities:**

- **Feature Stories:** Opportunities for feature stories in relevant industry publications and media outlets.

3. **Event Participation:**

- **Invitations:** Invitations to key events, including the Shell Eco-marathon competition, project presentations, and public demonstrations.

4. **Research and Development Insights:**

- **Project Reports:** Detailed reports on the design process, materials used, testing results, and performance analysis.

5. **Community and Educational Impact:**

- **STEM Promotion:** Contribution to STEM education and sustainability initiatives, enhancing the sponsor's reputation as a supporter of educational and environmental causes.
- **Mentorship Opportunities:** Opportunities for company engineers and professionals to mentor team members, fostering a connection between industry and academia.

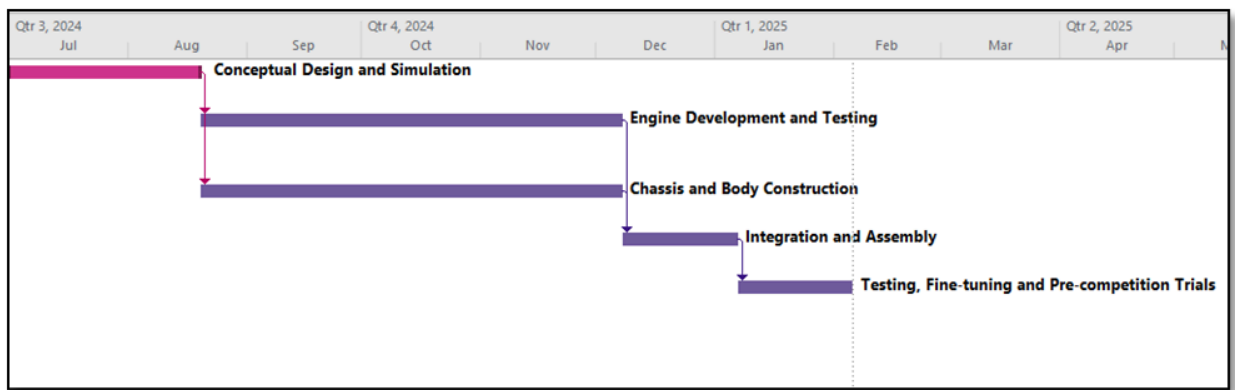
6. **Networking and Collaboration:**

- **Access to Networks:** Access to a network of academic and industry professionals involved in the Shell Eco-marathon and related events.
- **Collaborative Opportunities:** Potential for future collaborations on innovative projects or research initiatives.

3.3 Timeframe

Project Phases:

- Month 1-2: Conceptual design and simulations.
- Month 3-4: Engine development and testing.
- Month 5-6: Chassis and body construction.
- Month 7: Integration and assembly.
- Month 8: Testing, fine-tuning, and pre-competition trials.



3.4 Resources

Equipment and Tools:

1. Manufacturing Tools:

- CNC machines for precision machining of components.
- 3D printers for rapid prototyping of parts.
- Access to carbon fiber manufacturing workshops.
- Provide a limited budget to support if machinery is not available.

2. Testing Equipment:

- Wind tunnel for aerodynamic testing.
- Vehicle testing facilities for performance evaluation.
- Provide a limited budget to support if the facility is not available.

3. Spare Part Inventory:

- Access to spare part inventory if available.
- Facilitate connection with spare part suppliers.
- Provide a limited budget if option is not available.

3.6 Funding and Sponsorship

Green Gears will now allow multiple corporations to sponsor the project as the team aims to support sustainable growth and maximize its efficiency. Hence, a subscription method was created to allow all investors and sponsors to take part in supporting the ultra-efficient fuel consuming car as follows:

Elite Package

- Allowed to only a maximum of 5 sponsors
- Logo to be placed on car that will be participating in Asian regional qualifiers and global competition
- Name and Logo to be placed on competition suit
- Access to all articles
- Access to progress of manufacturing
- Name and logo of sponsor to be headlined on website and instagram page
- Inclusion in all social media posts

- Feature in all videos published
- Name of sponsor to be included in article publications
- Inclusion in all group meetings and access to instant-connection platforms (whatsapp groups, google drive, ...)
- Inclusion in scheduled recurring update meetings
- Appreciation letters and group photos with the team

Platinum Package:

- Allowed to only a maximum of 5 sponsors
- Access to all articles
- Access to progress of manufacturing
- Name and logo of sponsor to be headlined on website and instagram page
- Name and Logo to be placed on competition suit
- Inclusion in all social media posts
- Feature in all videos published
- Name of sponsor to be included in article publications
- Inclusion in all group meetings and access to instant-connection platforms (whatsapp groups, google drive, ...)
- Inclusion in scheduled recurring update meetings
- Appreciation letters and group photos with the team

Gold Package:

- Allowed to only a maximum of 4 sponsors
- Access to progress of manufacturing
- Name and logo of sponsor to be sub headlined on website
- Name and Logo to be placed on competition suit
- Inclusion in most social media posts
- Feature in most videos published
- Name of sponsor to be included in article publications
- Inclusion in group meetings and access to instant-connection platforms (whatsapp groups)

- Appreciation letters and group photos with the team

Silver Package:

- Allowed to only a maximum of 3 sponsors
- Name and logo of sponsor to be sub headlined on website
- Name and Logo to be placed on competition suit
- Inclusion in some social media posts
- Feature in some videos published
- Name of sponsor to be included in article publications
- Inclusion in some group meetings and access to instant-connection platforms (whatsapp groups)
- Appreciation letters and group photos with the team

Bronze Package:

- Allowed to only a maximum of 3 sponsors
- Name and logo of sponsor to be mentioned on website
- Inclusion in some group meetings and access to instant-connection platforms (whatsapp groups)
- Appreciation letters and group photos with the team

All forms of financial funding towards Green Gears will be through bank transfer, direct cheques, or cash. On the other hand, if facilities mentioned above are provided by a sponsor and

Green Gears are allowed full access to machinery, then this will fall under the technical and engineering support.

3.7 Reporting

According to the sponsor's subscription package, the means of reporting and communication will be tailored to their level of support to ensure maximum engagement and transparency. Sponsors opting for the full packages will enjoy full access to all project-related materials. This includes 24/7 viewer access to our pending articles, PowerPoint presentations, and a comprehensive collection of online documents. This level of access allows sponsors to stay informed about every aspect of the project's progress in real-time.

In addition to document access, sponsors will receive regular updates through common platforms such as WhatsApp, ensuring they are kept up-to-date with the latest developments and milestones. They will also have the unique opportunity to contact team leaders directly upon request, facilitating open and immediate communication.

Sponsors will be included in all group meetings, providing them with an insider's view of our planning and decision-making processes. Furthermore, they will have access to instant-connection platforms like WhatsApp groups and Google Drive, allowing them to seamlessly collaborate and interact with the team. This approach to reporting and communication ensures that sponsors are not just passive observers but active participants in the project, fostering a strong, collaborative relationship built on transparency and mutual engagement.

4 Appendix

4.1 Supporting Documentation and Links

<https://www.shellecomarathon.com/>

[https://www.shellecomarathon.com/2024-programme/regional-asia-pacific-and-middle-east.h
tml](https://www.shellecomarathon.com/2024-programme/regional-asia-pacific-and-middle-east.html)

4.2 Meet The Team



Ziad Sefelnasr

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Electrical Engineering student with experience in programming, energy, and control.

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Saad Harairy

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Adept at merging theoretical knowledge with practical applications.

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A Mechanical Engineering student passionate about material and vehicle design.

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Zayna Khawaja

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Combines skills in engineering design and interests in energy & environmentalism to create a sustainable haven.

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Ahmed Al Hamarna

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Passionate electrical engineer, driven to push the boundaries of technology.

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Jack of all trades, hoping to leave a positive impact wherever.

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