

Sustainability Plan

Author(s)	Al-Hussein Technical University (HTU)
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Project Coordinator

Prof Ahmed Al-Salaymeh,

The University of Jordan (UJ)

Queen Rania Street I Amman 11942, Jordan

Tel: +962-6-53 55 000 Ext. 22816 | Mob: +962-777-64 4364 | Fax: +962-6-53 00 237

Email: eco-car@ju.edu.jo

Project website: <http://sites.ju.edu.jo/en/eco-car/home.aspx>



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1. INTRODUCTION

The main objectives of the ECO-CAR project are to design demand driven programs in the field of EV/HEV satisfying industrial and economical needs of Jordan and provide a platform for students to gain skills and life long careers. Furthermore, it should increase the employability of engineers in local and international markets by training them on the needed skills in the field of EV and HEV. The project will also enhance the quality of available vocational training provided by the vocational training centers, through employing the trained engineers in those centers. Partners will seek signing cooperation agreements with these training centers. Another objective is to improve the level of provided services for repairing and maintaining electric and Hybrid vehicles in Jordanian enterprises. This will help Jordan to become a host for Electrical and Hybrid vehicles industry in the future. University enterprise cooperation is another by-product of this project where students and faculty can have a workplace internships and services in vehicles companies. Globally, this project will help in lowering harmful emissions of conventional vehicles in the transportation sector as it will promote the move from gasoline-based vehicles to EV/Hybrid vehicles.

ECO-CAR aims to enable Jordanian universities face the “fourth industrial revolution challenge” by modernizing their ‘EV/HEV’ curricula and offerings, developing and implementing sustainable certificates/degree programs, building staff capacity and enhancing the awareness of the EU support and promote technical and cultural visibility of the partners.

The main outcomes of this project are summarized as:

1. Develop, integrate, accredit and evaluate some courses, certificates, diplomas or degree programs with an appropriate practical component in EV/HEV at Jordanian partner universities that are in- line with the Bologna requirements.
2. Engage faculty and engineers in the development of interactive instruction techniques for lectures, laboratory courses, and sharing experiences with EU partner universities.
3. Develop and implement course contents using distance learning.
4. Extend services and training in collaboration with the local and regional industry and community.
5. Improve the human capacity of Jordanian by providing training and upgrading opportunities in the EU for aspiring academic members especially females and technical staff.

The sustainability plan lays out a road map as a guide towards building responsible academic courses EV/HEV with adequate and reliable outputs. Building that future will require not only long-term actions, but also immediate actions and investments that will help to fulfil the short-term jobs required to satisfy the demand needed by EV/HEV businesses and establish the clean energy industry. However, courses that follow a long-term sustainable plans that will be more successful and competitive than others. As the world of academics becomes ever more competitive on labor market, sustainability will become important not only for success but also, eventually, for survival. This plan will give power to the ECO-CAR project through initiatives that are technically impactful, environmentally accountable and economically justifiable.

The project aims to sustain the project through the following:

- Activating the National and International Network (NIN) developed through the project.
- Having members of stakeholders. within the collage councils at faculties hosting the program

- Having a task force from faculty members and members representing the private sector to continuously review outcomes of the program and propose updates to its contents and delivery scheme. They even may recommend market-driven changes.
- Maintain links with EU partners to build on the outcomes of this project and continuously share experiences.

2. ELEMENTS OF THE PROGRAM

Having sustainable project elements and processes will lead to a sustainable program. Thus, we need to ensure the sustainability of the derived programs, key components and processes. To do so, we need first to identify the key elements and processes of the proposed programs. The following are the main elements:

1. Location, logistics and labs
2. Academic Staff
3. Students
4. Curriculum
5. Stakeholders

2.1 Location, Logistics and Labs

To secure sustainability, the courses should run at each partner university simultaneously. The commitment of each university toward the program will guarantee and secure a location to host the program. At the same time, performing the accreditation process of the selected programs at all partner universities will grant the approval and the commitment of all administrative levels in the universities toward the program. Thus, each partner university will provide the required logistics for the new programs in the same manner as the other running courses at the university. This will add minimum cost on each university toward the new courses.

Furthermore, new lab equipment for the project should take into consideration the real need for the program. Each partner university from Jordan will select the labs equipment in such a way to strengthen the courses, allow offering increased training opportunities for the faculty, staff and students. It also should enable students to continue producing visionary work. Thus, we will carefully select the lab equipment to satisfy the academic needs with proper demonstration and satisfy the workplace needs. It also should take into consideration the type of research activity that students can use to carry out some of their hands-on training and research projects. Finally, partner universities will use this equipment as training benches to improve capacities of students on state-of-the-art technologies and systems related to the program.

2.2 Academic Staff

Professors are key elements of any academic program. They educate future leaders by providing ECO-CAR courses in engineering research and education. This includes continued improvement of the undergraduate curricula for education of a new breed of EV/HEV specialist. The graduated students should possess not only a strong knowledge of fundamentals, but also the knowledge required for broad applications and an understanding of technical and research issues that determine sustainable and technological choices. The faculty members should be aware that their tasks must include

- Commitment to provide students with fundamental knowledge within the main courses topics, and at the same time, broaden the curriculum by introducing new courses and real examples with continuing focus on professional team projects.
- Establish faculty task force to develop curriculum that fulfil project objectives.
- Develop courses elaborated on the base of local needs and state of the art technologies, and accredited following Bologna requirements including E-learning courses.

To achieve these goals, partner universities will link ECO-CAR program to the already offered “sustainable” programs within its academic and community based programs.

2.3 Students

Students’ community, as the main beneficial of the of ECO-CAR outcomes it is essential to get their input and feedback on the new proposals, raise their awareness about project aims, and train them on the needed skills.

To achieve sustainability for the student element, we need to insure the enrolment of the maximum number of students at all times. The accreditation committee will determine the program student-capacity according to the number and free faculty members who are involved in the program. To ensure that, we need to attract students to the program by:

- Creating a more welcoming and diverse community through Info days, seminars and advertisement. This part is in process now and will continue.
- Promote increased interaction between undergraduate students and different labor market to be a primary contributor to the environment research.
- Enhance the partnership with private sector.

2.4 Other Stakeholders

Other stakeholders are identified as follows:

- Administrative staff within each partner by involving this target audience in the project activities (i.e., participation in surveying, the train-the-trainers’ workshops, and seminars).
- University management, as their involvement is crucial for sustainable development of the project and financial support. Regular contributions within academic scientific boards, common interuniversity meetings involving the participation of university management units will strengthen the competitiveness of universities through e-learning/e-teaching.
- Multipliers such as the private and public authorities and companies will enhance chances to reach direct and indirect beneficiaries and to get their input and feedback on the new proposals.
- International community. The visibility of the project at European level and beyond is a very useful way to disseminate our ideas and through this, enable and foster future and interesting relationships for future collaboration.

2.5 Curriculum

In order to have curricula that help in having sustainable courses, it must have the following characteristics:

1. Must be flexible to adapt the changes in the labor market.
2. Courses must be interactive; reviewed every year through clear and present mechanisms
3. Must utilize all elements of available sustained program. This means to enable the students to take it as a by-product of their degrees or a certified program also to allow them to complete higher education in any other field.
4. The practical component of the program needs to meet the industrial expected outcome and the teaching of the theoretical part needs meet the requirements of an updated sustainable learning outcome.

2.5 Sustainability Analysis

Sustainability analysis is done for each Jordanian University based on the following elements:

- Laboratories.
- Classrooms.
- Academic Staff.
- Institute Support
- Course Material.
- Accreditation.

Accordingly, each university filled the Sustainability Forms.

[Appendix A](#). Sustainability Analysis.

3. FINANCIAL SUSTAINABILITY

Sustainability of training and educational programs is measured in similar fashion to any other business activity, profit, and loss. Any business activity is considered profitable once its income exceeds its incurred costs.

A role of thumb in the training business, considers the business sustainable when its programs consistently achieve 10% or more profit margins. A profit margin calculates the percentage of profit to the incurred cost.

Sustainability analysis focuses on the ability of any training program or diploma to make profits. Calculations of the breakeven point is important to know the boundaries of gain/loss.

The financial calculations B.

[Appendix B](#). Excel Sheet - Financial Sustainability Analysis

4. PROGRAMS AT JORDANIAN UNIVERSITIES

The eight Jordanian universities have implemented ECO-CAR degrees as listed in Table 1.

Table 1. Number of students at the ECO-CAR programs at Jordanian Universities

Universities	Community College Diploma Number of students	Vocational Diploma Number of students
The University of Jordan(JU)		Cohort One: 23 Cohort Two: 23
Jordan University of Science and Technology (JUST)		Cohort One: 11 Cohort Two: 14
Mutah University (MU)		13
Tafila Technical University (TTU)	Cohort One 25 Cohort two 14 Enhanced Program	24
Al-Balqa Applied University (BAU)	56 Enhanced program	6
Hussein Technical University (HTU)		22 Enhanced program
Applied Science University (ASU)		Cohort One: 15 Cohort Two: 13
Al-Zaytoonah University of Jordan (ZU)		15

Each of the Jordanian universities did its own sustainability analysis. The financial sustainability analysis is provided in Table 2.

Table 2. Fees and Breakeven Points for Jordanian Universities

University	Degree	Program fees per student (JD)	Break Even Point Number of students	Sustainable
JU	Vocational	1,300	8	YES
JUST	Vocational	1,250 JD	10	YES
MU	Vocational	600 JD	40	
TTU	Community	1,575	N/A	YES
	Vocational	300	15	
BAU	Community	1575 JD	N/A	YES
	Vocational	400 JD	15	
HTU	Vocational (with Hakama)	50 JDs (supported)	N/A	YES (with government support)
ASU	Vocational	1,100	15	YES
ZU	Vocational	800 non-ZU (2)	10	YES
		300 ZU (13)		

5. SWOT ANALYSIS

The following is the Strengths, Weaknesses, Opportunities, and Threats analysis:

Strengths:

- Comprehensive Curriculum.
- Access to Research and Innovation.
- Networking Opportunities.
- Accreditation and Recognition.
- Signed agreements with major vehicle companies.
- A greater demand for professionals with skills in the EV/HEV sector.
- High potential for the industry to expand and develop.
- Focus on sustainable development and clean energy is in line with current National priorities.

- High interest in practical learning.
- The existence of a well-equipped workshop/lab that contains sufficient and modern equipment.
- The presence of a sufficient number of educated and well-trained staff.
- Presence of BSc and Community College Diploma programs
- The program promotes for self-employment instead of employment
- The commitment from the universities
- Follow up with up-to-date technologies in EV/HEV
- The eight universities are located around Jordan and at different geographical locations.

Weaknesses

- Limited career options outside of the EV/HEV industry
- Lack of marketing
- Lack of availability of trainers
- Lack of females interested in this field.
- Low number of students
- Challenges in finding updates resources for the course materials
- The large number of universities that offer bachelor degree.
- The need for capital to start private self-employment project.
- The few difficulties in the communication between the trainers and the management
- Longer Program Duration.
- Higher Tuition Fees.
- Limited Practical Focus.
- Limited hands-on practical training compared to vocational schools.
- Limited Flexibility.

Opportunities

- New funds and research for expanding the Electric vehicle labs.
- Potential for career advancement and higher earnings in a growing industry
- Possibility to collaborate on innovative projects and cutting-edge technologies.
- Governmental support for vocational education and training.
- The large demand for specialized technicians in electric and hybrid vehicles maintenance and repair.
- Rapid transition to the purchase of electric and hybrid vehicles.
- Greening the environment through graduating specialized technicians in maintaining EV and HEV vehicles
- The increased interest in EV/HEV locally and globally
- Emerging Industry Demand.
- Collaboration with Industry Partners.
- Integration of Emerging Technologies.
- Continuing Education Pathways.

Threats:

- Experienced staff leaving universities.
- Staff being overloaded and not allocating enough resources for the program.
- Unavailability of specialized technicians for high-maintenance labs
- Negative attitudes from certain groups toward vocational and technical training
- Changes in technology could make specific skills or knowledge obsolete.
- Low cash returns from vocational professions
- Job security in the private sector
- Challenges in convincing the local people to obtain HEV and EV vehicles due to the cost of this type of vehicles.
- Job security in the private sector
- Competition from Vocational Schools.
- Rapid Technological Advancements.
- Industry-Specific Certification Programs.
- Limited Funding.

6. CONCLUSION

The ECO-CAR project produced ECO-CAR degrees at all the eight Jordanian universities that participated in the project. All universities have done an extensive sustainability study and concluded that the programs will be sustainable if they abide by the plans, retain the experienced faculty, and maintain the university's commitment to the program.

There are threats to maintaining the profitability of the programs as this will depend on many factors, such as the interest of students and market-demand.