SunDrive

High-Level Feasibility Study

Submitted to:

The Ministry of Digital Economy and Entrepreneurship

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Prepared by:

استدامة للاستشارات
Istidama consulting

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Executive Summary

SunDrive aims to integrate renewable energy-powered fast electric vehicle (EV) charging stations with urban parking facilities. Utilizing solar power, these smart charging stations provide a sustainable and efficient solution for EV owners. The parking facilities are equipped with features such as real-time availability tracking, automated payment systems, and reservation options. SunDrive addresses the growing demand for accessible EV charging infrastructure.

The feasibility study demonstrates promising market potential, technical feasibility, and financial viability. The projected revenue streams include pay-per-use fees and monthly parking subscriptions, which are expected to grow over the first five years. Additionally, the operational expenditures and capital investments are structured to support sustainable growth.

Key recommendations include engaging in regular consultations with regulatory bodies, investing in reliable technology, implementing robust maintenance schedules, and adopting targeted marketing campaigns. Differentiation through superior service and strategic partnerships will help mitigate potential risks, while energy storage solutions and efficient grid management will ensure consistent service.

Given the positive financial projections and substantial economic contributions, it is recommended to proceed with the project. SunDrive has the potential to foster both environmental sustainability and economic growth by promoting the adoption of clean energy solutions and supporting the infrastructure needs of electric vehicles.

1. Introduction

The adoption of electric vehicles (EVs) in Jordan is increasing, leading to a rising demand for accessible and efficient charging infrastructure in urban areas. However, the current infrastructure is often insufficient to meet this demand, causing inconvenience for EV owners. Urban residents and commuters frequently face challenges in finding reliable charging spots, which can deter the broader adoption of EVs and slow the transition to more reliable transportation options.

This issue has significant implications. Insufficient EV charging infrastructure limits the practicality and appeal of electric vehicles, potentially hindering efforts to reduce greenhouse gas emissions and address climate change. Without adequate charging options, the environmental benefits of EVs may not be fully realized, posing a challenge to global initiatives aimed at promoting clean energy and sustainable urban development.

SunDrive offers a solution by integrating solar-powered EV charging stations with smart parking facilities. These stations provide a practical and efficient option for EV owners, featuring real-time availability tracking, automated payment systems, and reservation options. By utilizing renewable energy and advanced technology, SunDrive aims to enhance the user experience, address the demand for more accessible EV charging infrastructure, and contribute modestly to the reduction of greenhouse gas emissions. This service is designed

to support the gradual adoption of clean energy and facilitate a more sustainable urban environment.

2. Market Analysis

The macroeconomic environmental for renewable energy and electric vehicle (EV) infrastructure in Jordan presents both challenges and opportunities. Governments worldwide, including Jordan, are increasingly prioritizing green technologies due to the urgent need to address climate change and reduce carbon emissions. This has resulted in significant investments and supportive policies aimed at promoting renewable energy adoption, particularly solar power, which is a key component of SunDrive's solution.

Despite gasoline-powered vehicles retaining dominance in the market, Jordan has seen a gradual increase in the adoption of electric vehicles. By 2019, there was a fleet of 18,000 privately-owned EVs. The government has also driven EV adoption rates by electrifying its public transport fleet, replacing internal combustion engine (ICE) vehicles with Tesla EVs. Reports suggest that the Kingdom of Jordan's EV fleet reached the 60,000-mark at the end of 2022, representing around 3.33% of the market's total vehicle fleet[1].

The renewable energy sector, especially solar energy, has experienced robust growth due to declining costs and advancements in technology. Economies of scale and improvements in photovoltaic technology have made solar power more affordable and efficient. This trend is expected to continue, with projections indicating growth in the solar energy market. Such economic dynamics provide a conducive market for SunDrive's solar-powered EV charging stations.

Key economic indicators also support the feasibility of SunDrive. For instance, while the Jordan's GDP growth rate shows fluctuations, the country has maintained a steady average growth rate of 2.5% over the past decade[2], indicating potential for investment in new technology. Additionally, the urbanization rate in Jordan remains quite high at 92%[3], leading to a higher concentration of potential EV users in cities. This urban growth drives demand for integrated solutions like SunDrive, which combines EV charging with urban parking.

Looking ahead, there is an anticipated annual growth rate of 8.08% (CAGR 2024 – 2028) in the EV market, which would result in projected market volume of US$87.7 million by 2028[4]. This growth underscores the expanding economic opportunity for SunDrive to capitalize on the increasing demand for EV charging infrastructure.

The Economic Modernization Vision has prioritized enhancing environmental policies and regulations to improve people's mobility through increased EV adoption and lower greenhouse gas (GHG) emissions[5].

[1] https://www.fitchsolutions.com/bmi/autos/jordan-ev-profile-segment-grow-reduced-import-taxes-and-arrival-new-affordable-models-08-06-2023
[2] https://www.worldbank.org/en/country/jordan/overview
[3] https://www.statista.com/statistics/455851/urbanization-in-jordan/#:~:text=Urbanization%20in%20Jordan%202022&text=In%202022%2C%20the%20share%20of,unchanged%20at%20around%2091.83%20percent.
[4] https://www.statista.com/outlook/mmo/electric-vehicles/jordan
[5] https://www.jordanvision.jo/img/vision-en.pdf

Moreover, the government of Jordan prepared a National E-mobility Strategy in 2023. This strategy highlights the energy sector as a focus area, particularly regarding the additional electricity demand require for EV charging and how the Jordanian power sector can accommodate such demand. It is noted that the time profile of EV charging can exacerbate peak demand, creating physical stress on power systems and financial stress due to additional investments required for power infrastructure upgrades[6].

Additionally, solar or wind energy currently powers approximately 29% of the electricity grid in Jordan, and the country aims to reach 50% of electricity from renewables by 2030. This ambitious target will be achieved through focus on smart grid development and energy storage projects, which will help to manage the increased demand and integration of renewable energy sources[7]. Jordan's journey from zero investment in solar and wind projects in 2013 to attracting more than $4 billion in investments in renewable energy projects by 2023 further underscores the government's commitment to this sector[8].

The industry outlook for EV infrastructure is cautiously optimistic with growing recognition of the need for comprehensive charging networks to support the increasing number of electric vehicles. The competitive landscape includes various players, but the market is not yet saturated, providing opportunities for innovative solutions. Moreover, the regulatory environment is becoming more favorable, with the government introducing incentives for renewable energy projects and stricter emissions regulations that encourage the adoption of electric vehicles.

The economic trends affecting renewable energy and EV infrastructure are favorable, with significant investments and policies supporting green technologies. The renewable energy sector, particularly solar power, is experiencing robust growth due to declining costs and increased efficiency. The global push towards reducing carbon emissions further strengthens the market potential for renewable energy solutions. Key economic indicators, such as the GDP growth rate, renewable energy adoption rates, and urbanization trends, are positive, supporting the growth of SunDrive.

Overall, the macroeconomic conditions present both challenges and opportunities for SunDrive's business model. While gasoline-powered vehicles still dominate, the increasing adoption of electric vehicles in Jordan, supported by developing economic trends, policies, and strategic planning in the energy sector, creates a promising landscape for the deployment and expansion of solar-powered EV charging infrastructure.

Jordan's EV charging network is developing, with 54 licenses for electric charging stations issued in 2022, including 41 for public stations and 13 for private stations. However, the current network remains below 100 charging points, resulting in an EV to charging point ratio of over 500. This ratio presents a challenge, as local EV drivers report long waiting times and

[6] https://slocat.net/trt-helping-to-shape-jordans-e-mobility-transition-strategy/
[7] https://www.trade.gov/country-commercial-guides/jordan-renewable-energy#:~:text=Solar%20or%20wind%20energy%20powers,development%20and%20energy%20storage%20projects.
[8] https://www.ifc.org/en/stories/2023/powering-up-jordan-s-renewable-energy-market#:~:text=%E2%80%9CJordan%20also%20went%20from%20zero,also%20offers%20significant%20environmental%20benefits.

restricted charging sessions, leading to elevated 'range anxiety'. Despite these issues, the '2025 Jordan National Plan' suggest significant improvements are on the horizon[9].

Residential charging stations in Jordan are directly connected to the power distribution network, typically having a relatively low power rating (5 – 7 kW) and long charging times. In contrast, fast charging stations can charge EVs more quickly, with power ratings exceeding 19.2 kW at level-3 charging.

Challenges in the market include raising awareness about the cost-effectiveness of EVs among regular citizens and ensuring the distribution of charging stations to prevent EV owners from being cut off past the 150km distance limit of an average EV. Efforts to address these challenges are essential to support broader EV adoption.

A key factor driving the cost-effectiveness of EVs in Jordan is the cost of electricity compared to gasoline. For instance, the cost of driving 400 kilometers in an EV requires around 82 kilowatt-hours (kWh) of electricity. Based on the power tariff in the Kingdom, which is around 112 fils per kWh, the cost of driving one kilometer in an EV is approximately 23 fils. In comparison, the cost for gasoline-powered conventional cars is about 81 fils per kilometer when using 90-octane gasoline and 105 fils per kilometer when using the more expensive 95-octane gasoline[10][11][12]. This significant cost difference highlights the financial benefits of switching to electric vehicles.

SunDrive targets urban residents, commuters, professionals, and urban/suburban EV owners. Market research indicates a growing demand for EV infrastructure, driven by increasing EV adoption and urbanization. Customers prioritize convenience, reliability, and sustainability, making SunDrive's integrated solution attractive.

The competitive landscape includes existing pilot projects and companies like Tayar for Renewable Energy, providing solar electric systems for EVs. SunDrive can benefit from the presence of such projects and is able to differentiate itself with smart features and focus on user experience.

Globally, successful startups like ChargePoint and Tesla's Supercharger network have demonstrated viability and demand for EV charging infrastructure. ChargePoint's extensive network and Tesla's integration with their vehicles highlight the importance of scalability and user-centric features. SunDrive can learn from their strategies, emphasizing partnerships and technological innovation to scale efficiently.

The development of Jordan's EV charging infrastructure is essential for reducing range anxiety and supporting the growing number of EVs. The ongoing efforts to expand the public charging network and the strategic initiatives to raise awareness about the benefits of EVs are crucial steps toward achieving a sustainable transportation future in Jordan.

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[9] https://www.fitchsolutions.com/bmi/autos/jordan-ev-profile-segment-grow-reduced-import-taxes-and-arrival-new-affordable-models-08-06-2023

[10] https://jordantimes.com/news/local/driving-electric-car-could-cost-small-fraction-paid-gas-driven-vehicles#:~:text=The%20cost%20of%20a%20400,products%20on%20the%20domestic%20market.

[11] https://www.thefuelprice.com/Fjo/en/10-01-2015

[12] https://www.jepco.com.jo/ar/Home/%D9%81%D8%A6%D8%A7%D8%AA-%D9%88%D8%B4%D8%B1%D8%A7%D8%A6%D8%AD-%D8%AA%D8%B9%D8%B1%D9%81%D8%A9-%D8%A7%D9%84%D9%83%D9%87%D8%B1%D8%A8%D8%A7%D8%A1

3. Business Model

SunDrive's business model is designed to be scalable, with a focus on integrating solar-powered EV charging stations into high-traffic urban locations. The current study is based on the annual rental of a piece of land that houses three Level 3 solar-powered charging stations. These fast-charging stations can charge EVs within 30 minutes, providing a quick and efficient service to EV owners. The business model also includes a mobile app that facilitates the rental and management of the charging stations.

The piece of land is strategically located in a high-traffic area and can accommodate 80 cars. This setup ensures a steady flow of potential customers, maximizing the utilization of the charging stations. SunDrive generates revenue through two primary streams: monthly parking subscriptions and the EV-powered charging service.

SunDrive doubles as a convenient parking solution on a landscaped piece of land. While customers tend to their business, their cars will be charged and parked in the shade provided by the solar PV installations used to power the fast chargers. This adds an extra layer of convenience and attractiveness to the service, enhancing the customer experience.

The revenue streams are:

1. EV Charging Service (Pay-per-use fees): The level-3 charging stations offer fast charging at a rate of 9 JDs per charge for approximately 30 kWh. On average, each of the three charging stations provides 15 fast charges per day. This turnover rate generates revenue.
2. Monthly Parking Subscription: Customers can subscribe to a monthly parking plan for JD 25 per month, which guarantees them a reserved parking spot at the SunDrive location. This subscription model provides a stable and predictable revenue stream that drives traffic to the location.

The core activities of SunDrive include identifying the piece of land required, landscaping, installing the PV system, installing the EV chargers, and mobile app development.

The key resources necessary for the operation are the solar panels, Level 3 EV chargers, software for the mobile app, and land for the charging stations. Key partners for SunDrive include landowners, technology providers, and businesses in high-traffic locations.

The key personnel involved in SunDrive consists of the Founder/CEO who oversees the operation, strategic direction, and partnerships, an Operations Manager responsible for running the business, and a technician/parking supervisor who provides on-ground support to customers and charges the cars.

SunDrive's management and operational procedures encompass the installation of solar panels and Level 3 EV chargers on rented land, targeting urban areas and partnering with businesses to promote the monthly parking subscription and charging services, and providing real-time support through the mobile app and on-site assistance to ensure customer satisfaction.

The following table summarizes the revenues over the first five years of operation:

Table 1: Revenue projection

Description / Year	1	2	3	4	5
Pay-per-use fees (charges)	16,200	17,010	18,711	19,647	20,629
Pay-per-use fees (JOD per charge)	9	9	9	9	9
Subtotal Pay-Per-Use Fees (JOD	145,800	153,090	168,399	176,819	185,660
Subscriptions (unit)	300	375	469	586	732
Subscriptions (JOD per unit)	25	25	25	25	25
Subtotal Subscriptions (JOD)	7,500	9,375	11,719	14,648	18,311
Total Revenues (JOD)	153,300	162,465	180,118	191,467	203,970

EV Charging Services make up the majority of the quantity sold (around 97.6% to 96.5% over the five years) and contribute the most to the total revenue (around 95% to 91% over the five years). Despite its high volume, the revenue contribution shows a slight decrease in percentage over time due to the increasing share of subscription revenues. As for the Monthly Parking Subscriptions, they represent a smaller portion of the total quantity (around 2.4% to 3.5%) but contribute significantly to the revenue growth. Its share of total revenue increases from 5% in Year 1 to 9% in Year 5, due to the higher unit price and increasing customer base.

Overall, the revenue mix shows a strong reliance on high-volume EV charging services, with a significant and growing contribution from monthly parking subscriptions.

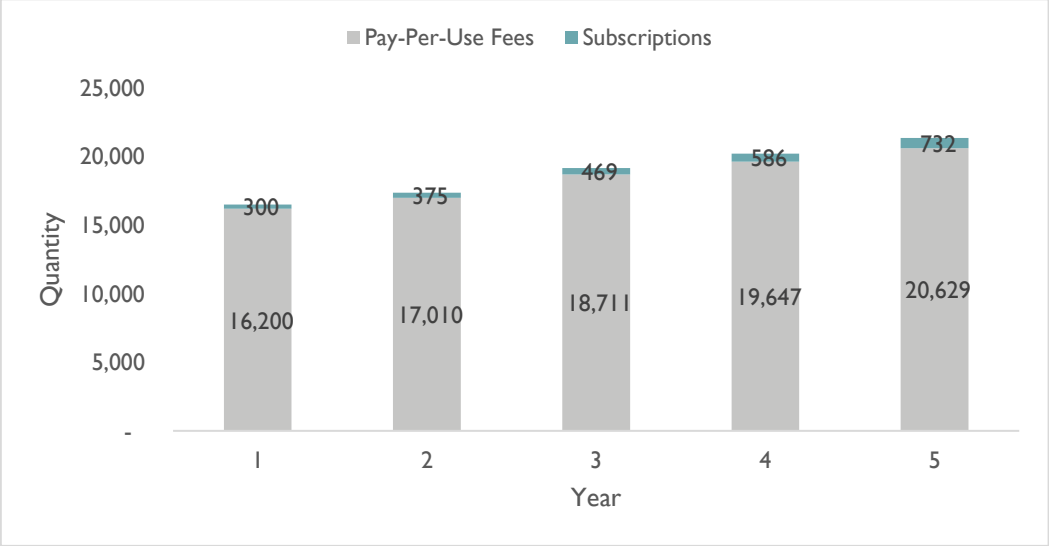

Figure 1 Product Mix by Quantity

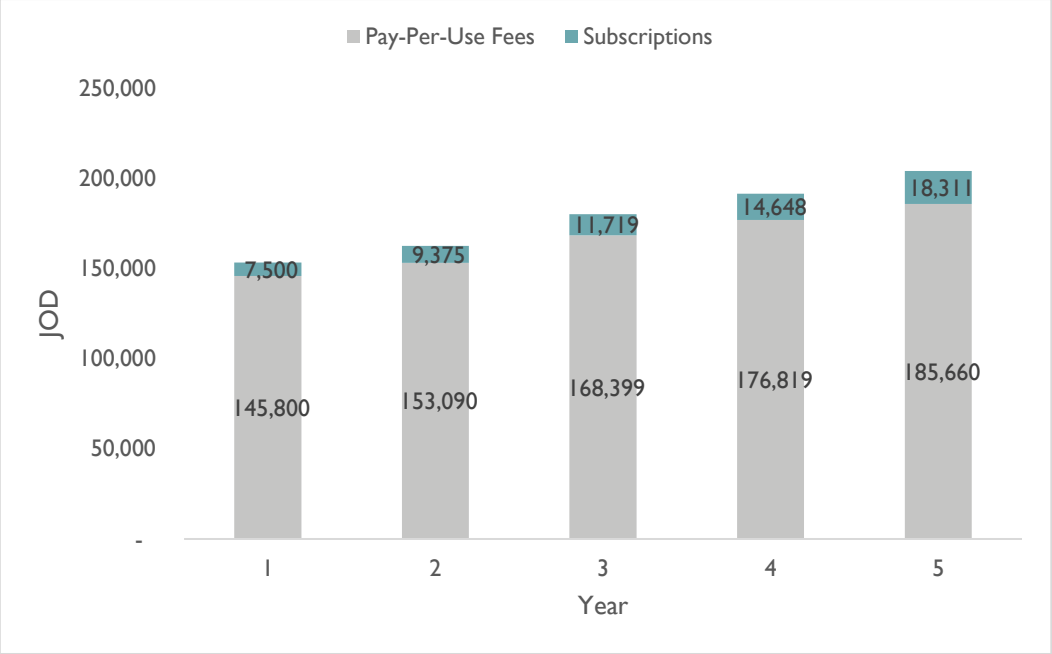

Figure 2: Product Mix by Revenue

4. Technical Analysis

The primary component of the cost of goods sold (COGS) for SunDrive is the cost of providing the pay-per-use EV charging service which cover any additional on-grid charging for when the solar panels do not generate enough electricity to power the charging stations which is estimated at a constant JOD 1.5 per charge for the five years. There are no direct COGS associated with the monthly parking subscriptions as they are primarily a service-based revenue stream with a direct unit cost.

Table 2: Cost of Goods Sold – five-year projection

Description / Year	1	2	3	4	5
Projected Demand (Quantity) Pay-Per-Use Fees	16,200	17,010	18,711	19,647	20,629
COGS / Unit Pay-Per-Use Fees	1.5	1.5	1.5	1.5	1.5
Sub-total Pay-Per-Use Fees (JOD)	24,300	25,515	28,067	29,470	30,943
Projected Demand (Quantity) Subscriptions	-	-	-	-	-
COGS / Unit Subscriptions	-	-	-	-	-
Sub-total Subscriptions (JOD)	-	-	-	-	-
Total COGS (JOD)	24,300	25,515	28,067	29,470	30,943

The manpower plan for SunDrive is designed to support service delivery. The plan includes hiring key personnel to manage technical, operational, and maintenance aspects of the business. The plan aligns with the projected growth and operational demands of SunDrive. Starting with a three-person team for the first two years, the number of human resources increases to 4 for Years 3 to 5.

Table 3: Manpower recruitment plan – five-year projection:

Title / Year	1	2	3	4	5
Founder/CEO	1	1	1	1	1
Operations Manager	1	1	1	1	1
Technician/Parking Supervisor	1	1	2	2	2
Cumulative Number of HR	3	3	4	4	4

The total HR costs, including salaries, social security, and health insurance, increase from JOD 36,546 in Year 1 to JOD 53,132 in Year 5. This structured salary progression ensures that SunDrive can attract and retain skilled employees.

Table 4: Manpower total cost – five-year projection

Title / Year	1	2	3	4	5
Technical Engineer	14,400	15,600	16,800	18,000	19,200
Operations Manager	12,000	12,600	13,230	13,892	14,586
Technician	4,800	5,040	10,584	11,113	11,669
Total HR Salaries	**31,200**	**33,240**	**40,614**	**43,005**	**45,455**
Social Security Cost	4,446	4,737	5,787	6,128	6,477
Health Insurance Cost	900	900	1,200	1,200	1,200
Total HR Cost	**36,546**	**38,877**	**47,601**	**50,333**	**53,132**

The operational expenditures (OpEx) analysis includes both the manpower costs and other operational expenses required to run SunDrive's services effectively. Below is a detailed breakdown of the OpEx over five years. The annual rent for the land is a significant cost of JOD 20,000 per year, providing the foundation for the business's physical operations. The costs of insurance and maintenance increase over time to accommodate the growing number of assets and the need for their upkeep. Advertising expenses increase from JOD 2,000 to JOD 3,000 by Year 3, indicating an investment in marketing to drive customer acquisition and retention. The total OpEx, including manpower costs, increases from JOD 71,529 in Year 1 to JOD 95,561 in Year 5. This growth is driven both by the scaling operational activities and the planned costs of maintaining service standards and expanding market reach.

Table 5: Operational Expenditures – five-year projection

Description / Year	1	2	3	4	5
Electricity	300	300	300	300	300
Rent	20,000	20,000	20,000	20,000	20,000
Water	30	30	30	30	30
Insurance	1,000	1,000	2,000	2,000	2,000
Stationary	30	30	30	30	30
Maintenance	3,260	3,260	6,521	6,521	6,521
Telecommunication	100	100	100	100	100
Website Charges	10	10	10	10	10
Advertising	2,000	2,000	3,000	3,000	3,000
Cleaning Material & Consumables	50	50	50	50	50
Hospitality Exp.	900	900	900	900	900
Legal & Accounting Fees	800	800	800	800	800
Sub-total OpEx	**65,026**	**67,357**	**81,342**	**84,074**	**86,873**
Other Costs	6,503	6,736	8,134	8,407	8,687
Total OpEx	**71,529**	**74,093**	**89,477**	**92,481**	**95,561**

The capital expenditures (CapEx) for SunDrive are focused on establishing the initial infrastructure necessary for the solar-powered EV charging stations and the associated services. These investments are crucial for setting up the foundational assets that will drive the operational and financial success of the business. The major portion of the initial investment is allocated to solar panels and related equipment, amount to JOD 86,000. This investment is critical for harnessing solar energy to power the EV charging stations and storage, ensuring a sustainable and eco-friendly operation. The cost for setting up the three EV charging stations is set at JOD 21,000. This includes the purchase and installation of Level 3 fast chargers, which are essential in providing rapid charging to customers. An investment of JOD 7,000 is made for developing a simple spot availability tracking and reservation platform. The cost of obtaining the necessary license from the Energy and Minerals Regulatory Commission (EMRC) is also included. An investment of JOD 5,000 is made for landscaping the site including levelling and civil works required for setting up the PV system.

The total initial capital expenditure is JOD 119,180, all of which is incurred in Year 0.

Table 6: Capital Expenditures Cost – five-year projection

Description / Year	0	1	2	3	4	5
PV System - Solar Panels and Equipment	86,000					
EV Charging Stations	21,000					
App development	7,000					
EMRC License	180					
Landscaping	5,000					
Total CapEx (JOD)	**119,180**	**-**	**-**	**-**	**-**	**-**

5. Financial Analysis

5.1 Financial Study Assumptions

The feasibility study is based on the following key assumptions:

Discount Rate: The study employs a conservative discount rate of 14%, reflecting a cautious approach to valuation.

Financing Structure: The project is entirely financed by equity. This conservative approach avoids the financial leverage and thus underestimates project value, given the lower cost of debt compared to equity.

Terminal Value: The project assumes a zero-terminal value at the end of year five, aligning with the study's conservative outlook.

Cash Flow Projection: Cash flows beyond year five are excluded from the analysis, focusing on the initial project phase.

Tax Rate: The assumed tax rate of 20% complies with Jordan's income tax law.

Depreciation Rate: Capital expenditure (CapEx) is depreciated at an annual rate of 20%. Any deviation from this rate may impact projected profitability but not project feasibility, as depreciation is a non-cash expense.

Working Capital Assumptions

Operational liquidity requirements are guided by the following assumptions:

- **Cash Reserves:** The project will maintain cash equivalent to 30 days of projected annual operational expenses, ensuring robust liquidity management.
- **Accounts Receivable (A/R) Collection Period:** The average collection period for receivables is 45 days, reflecting expected credit sales conversion into cash.
- **Accounts Payable (A/P) Payment Period:** The average payment period for payables is 0 days, indicating the timeframe for settling supplier obligations.
- **Inventory Management:** Inventory levels will be maintained to cover an average of two months of sales quantity, ensuring optimal stock levels to meet demand efficiently.

Capital expenditures expected to be incurred in the first year were included as part of the initial costs of the project.

Provisions were made within the initial cost to cover any potential negative net free cash flow that may arise during the first five years of operation, if needed.

5.2 Financial Study:

5.2.1 Projected Working Capital

This table shows that the net working capital needed for the project in its first year of operation is JOD 29,173, which has to increase steadily year over year to reach JOD 38,617 in its fifth year. The steady increase in working capital covers the rapid rise in project operations and the increase in projected revenues.

Table 7: Working capital projection (JOD)

Description / Year	1	2	3	4	5
Cash	5,961	6,174	7,456	7,707	7,963
Accounts Receivable (A/R)	19,163	20,308	22,515	23,933	25,496
Inventory	4,050	4,253	4,678	4,912	5,157
Net Working Capital	29,173	30,735	34,649	36,552	38,617
Change in Working Capital	-	1,562	3,914	1,903	2,065

5.2.2 Project Initial Cost

The project's initial cost is projected to be JOD 148,353, comprising JOD 119,180 as CapEx and JOD 29,173 as net working capital.

Table 8: Initial Cost Summary (JOD)

Description / Year	JOD
CapEx	119,180
Net Working Capital	29,173
Total Initial Cost	**148,353**

5.2.3 Projected Income Statement

The projected income statement indicates that the project will profit JOD 26,908 in its first year of operation. Moreover, net profit is expected to increase gradually over the study period, reaching JOD 42,904 in its fifth year of operation.

Table 9: Projected Income Statement (JOD)

Description / Year	1	2	3	4	5
Total Revenues	153,300	162,465	180,118	191,467	203,970
COGS	24,300	25,515	28,067	29,470	30,943
Gross Profit	**129,000**	**136,950**	**152,051**	**161,998**	**173,027**
OpEx	71,529	74,093	89,477	92,481	95,561
Net Profit Before Tax and Depreciation	**57,471**	**62,857**	**62,575**	**69,516**	**77,467**
Depreciation	23,836	23,836	23,836	23,836	23,836
Net Profit Before Tax	**33,635**	**39,021**	**38,739**	**45,680**	**53,631**
Tax Expense	6,727	7,804	7,748	9,136	10,726
Net Profit	**26,908**	**31,217**	**30,991**	**36,544**	**42,904**

The project is anticipated to achieve a 17.6% profit margin in its first year of operation. Furthermore, the gross and net profit margins are expected to slightly increase in subsequent years, reaching 84.8% and 21.0%, respectively, by the fifth year of operations.

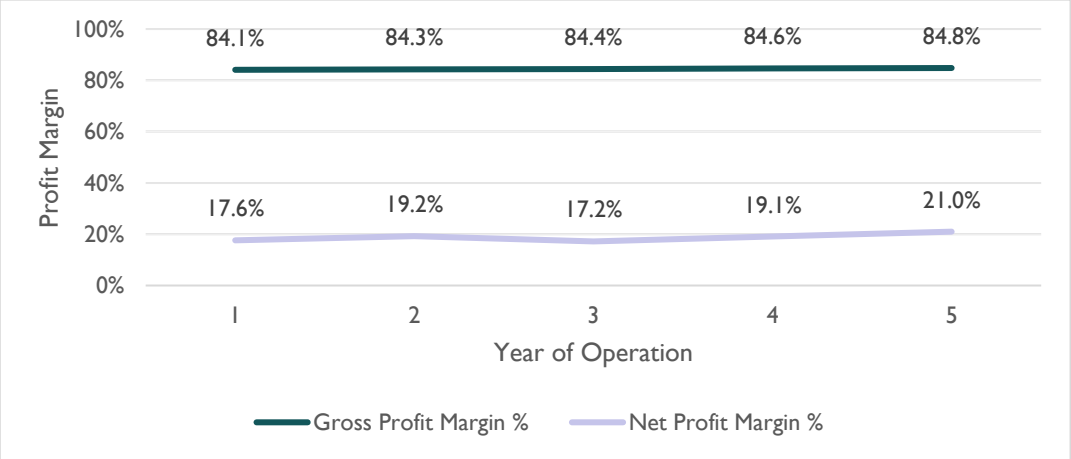

Figure 3: Gross vs Net Profit Margin

On the asset management side, the study shows that the return on investment will increase steadily from 18.1% in the first year of operation to 28.9% in the fifth year.

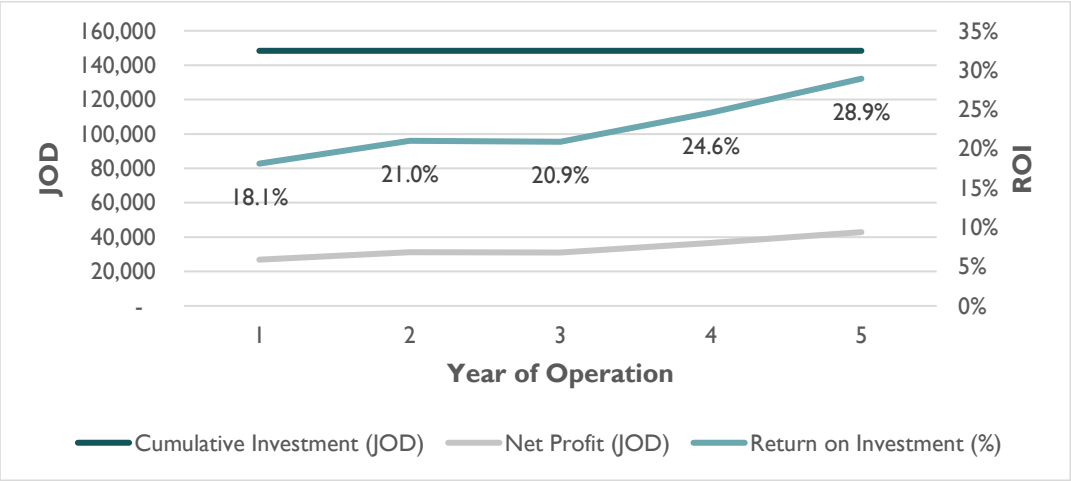

Figure 4: Return on Investment

5.2.4 Projected Free Cash Flow Statement

The table below demonstrates that the project will generate a positive free cash flow in its first year of operation, JOD 50,744. Moreover, in the following years, it is expected to generate positive free cash flows that increase gradually to reach JOD 64,675 in its fifth year of operation.

Table 10 : Free Cash Flow (FCF) Projection (JOD)

Description / Year	0	1	2	3	4	5
Cash-In Flow						
Net Profit		26,908	31,217	30,991	36,544	42,904
Depreciation		23,836	23,836	23,836	23,836	23,836
Injected Capital	148,353	-	-	-	-	-
Total Cash-In Flow	**148,353**	**50,744**	**55,053**	**54,827**	**60,380**	**66,740**
Cash-Out Flow						
Initial Cost	148,353	-	-	-	-	-
Changes in Working Capital		-	1,562	3,914	1,903	2,065
Total Cash-Out Flow	**148,353**	**-**	**1,562**	**3,914**	**1,903**	**2,065**
Free Cash Flow	**-**	**50,744**	**53,491**	**50,913**	**58,477**	**64,675**

Based on these results, the project's feasibility indicators demonstrate its viability, with a net present value of JOD 39,897.1 and a profitability index of 1.27. Moreover, the project's internal rate of return (IRR) is expected to be 24.27%, indicating feasibility is not sensitive to changes in market conditions.

Feasibility Indicators	
Net Present Value (NPV)	39,897
Profitability Index (PI)	1.27
Internal Rate of Return (IRR)	24.27%

5.3 Sensitivity Analysis

To assess the project's sensitivity to market conditions, a sensitivity analysis was conducted involving six unfavorable scenarios:

- Decrease projected revenues by 5% while keeping other variables constant.
- Decrease projected revenues by 10% while keeping other variables constant.
- Increase operational expenditure by 5% while keeping other variables constant.
- Increase operational expenditure by 10% while keeping other variables constant.
- Increase initial costs by 5% while keeping other variables constant.
- Increase initial costs by 10% while keeping other variables constant.

Table 11: Sensitivity analysis outcomes

Sensitivity Scenario	Net Present Value (NPV)	Profitability Index (PI)	Internal Rate of Return (IRR)
Original Case	39,897	1.27	24.27%
Drop in revenue by 5%	15,883	1.11	18.21%
Drop in revenue by 10%	8,132	0.95	11.77%
Increase in OpEx by 5%	28,152	1.19	21.33%
Increase in OpEx by 10%	16,407	1.11	18.33%
Increase in initial cost by 5%	32,479	1.21	22.04%
Increase in initial cost by 10%	25,062	1.15	19.97%

The sensitivity analysis shows that, in general, the project is feasible and not sensitive to unfavorable market conditions. Apart from the 10% drop in the revenue's scenario, the project's economic feasibility is strong and viable under all the above-mentioned scenarios. The drop in revenues has a more dramatic impact on the project viability than the increase in the OpEx or initial cost by the same magnitude. It is recommended that investors check and further study the market to ensure that the projected revenues are achievable within the thresholds of the proposed initial cost and operational expenditures.

6. Integration with Other Sectors

SunDrive's solar-powered EV charging stations integrate with various sectors, contributing to the overall e-mobility infrastructure ecosystem. The transportation sector benefits directly from increased EV adoption, which contributes to reducing greenhouse gas emissions and dependence on fossil fuels. By providing charging solutions at urban parking facilities, SunDrive supports urban planning and smart city initiatives, promoting efficient city living. The renewable energy sector is also supported, as SunDrive's reliance on solar power helps manage grid demand and encourages further investment in renewable energy projects. Additionally, the hospitality and retail sectors can utilize SunDrive's infrastructure to offer convenient charging solutions at hotels, shopping malls, and restaurants. This integration promotes sustainability and can potentially stimulate economic growth, as businesses adopting SunDrive's technology can attract environmentally conscious customers and enhance their service offerings.

7. Entrepreneur Persona

The ideal entrepreneur to lead SunDrive should possess a blend of expertise in renewable energy, electric vehicle infrastructure, and business management. A strong background in engineering or environmental science is essential, combined with hands-on experience in solar power and EV technologies. This individual should be strategic and analytical, capable of navigating the complexities of regulatory requirements and market dynamics. Excellent project management skills are necessary to oversee the installation and maintenance of charging stations, as well as the development of supporting software platforms. The entrepreneur should also have a keen understanding of customer needs and behavior, ensuring that SunDrive's services are user-friendly and reliable. Strong leadership and communication skills are crucial for building partnerships with stakeholders across various sectors, including government agencies, technology providers, and commercial businesses. A commitment to sustainability and a vision for promoting clean energy solutions will drive the success of this venture.

8. Stakeholders

The stakeholders for SunDrive encompass a diverse group essential to the project's success. Key stakeholders include EV owners who will benefit directly from the convenient fast-charging services. Government agencies and regulatory bodies play a crucial role in providing necessary approvals and support for infrastructure development and renewable energy incentives. Renewable energy companies and suppliers of solar panels and EV charging equipment are vital for ensuring the technical feasibility and reliability of the charging stations. Commercial businesses and property owners, particularly those in high-traffic urban areas, are important partners for hosting the charging stations. Environmental organizations and sustainability advocates support the broader mission of reducing carbon emissions and promoting clean energy. Investors and financial institutions provide the necessary capital and funding to scale the business. Each stakeholder group contributes to the holistic success and marketability of SunDrive, ensuring its integration into the wider community and economy.

9. Risk Assessment and Mitigation

This table summarizes the primary risks associated with the SunDrive project, assessing their potential impact, likelihood, and the mitigation techniques that will be employed to manage these risks effectively.

Risk	Impact	Likelihood (High/Medium/Low)	Risk Mitigation Technique
Regulatory Matters	Delays and added costs	High	Regular consultation with regulatory bodies and compliance checks
Technological Challenges	Service disruptions	Medium	Regular maintenance and investing in reliable technology
High Initial Costs	Financial strain	High	Securing adequate funding
Market Adoption	Slower revenue growth	Medium	Targeted marketing and education campaigns
Competitive Pressure	Reduced market share	Medium	Differentiation through superior service and features
Infrastructure Limitations	Capacity constraints	Low	Strategic partnerships and gradual infrastructure expansion
Maintenance and Downtime	Operational disruptions	Medium	Implementing robust maintenance schedules
Energy Supply Variability	Inconsistent service	Low	Utilizing energy storage solutions and grid management

Environmental Factors	Operational delays	Low	Designing resilient infrastructure and contingency planning
Customer Acceptance	Usage variability	Medium	Providing incentives and ensuring high service quality

To ensure the success of the SunDrive project, it is essential to adopt a strategic approach that addresses potential risks and leverages opportunities. Firstly, engaging in regular consultations with regulatory bodies will help navigate regulatory matters smoothly and avoid potential delays and added costs. Investing in reliable technology and implementing regular maintenance schedules will mitigate technological challenges and minimize service disruptions. Securing adequate funding and adopting a phased investment approach can manage high initial costs effectively. To drive market adoption, targeted marketing and education campaigns are crucial in raising awareness and encouraging EV usage. Differentiation through superior service and features will help mitigate competitive pressure, while strategic partnerships and gradual infrastructure expansion can address infrastructure limitations.

Additionally, it is recommended to utilize energy storage solutions and efficient grid management to tackle energy supply variability. Designing resilient infrastructure and having contingency plans in place will mitigate environmental factors that could cause operational delays. Providing incentives and ensuring high service quality will enhance customer acceptance and usage consistency. According to the financial analysis, a 10% drop in revenue results in a profitability index of less than 1, highlighting the importance of maintaining robust revenue streams. Therefore, implementing the aforementioned risk mitigation techniques and continuously monitoring financial performance are essential to sustaining profitability and achieving long-term success for SunDrive.

10. Conclusion

The feasibility study for SunDrive highlights significant potential for success and positive economic impact, indicating that the project can leverage the growing demand for renewable energy and electric vehicle infrastructure in Jordan. The project aims to attract a diverse audience of EV owners and environmentally conscious consumers by offering efficient and sustainable charging solutions. Initial findings indicate market viability, substantial economic contributions, and positive financial projections, affirming the project's feasibility and potential for fostering both environmental sustainability and economic growth. By implementing strategic risk mitigation techniques and maintaining robust revenue streams, SunDrive is well-positioned to achieve long-term success and contribute to the broader adoption of clean energy solutions.

Disclaimer

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Founders and investors considering this project are advised to conduct further analysis on projected adoption rates, development costs, and ongoing operational expenses. This additional scrutiny will help mitigate potential risks related to technology challenges, changes in regulations, market penetration, and competitive pressures.

The report does not constitute any form of commitment or recommendation on the part of MoDEE or Istidama Consulting.