IMPLEMENTATION COST BENEFIT ANALYSIS

Installation site:	UNV (FAA Identifier)
Customer:	University Park Airport
Installation product:	EA infrastructure system for cargo demands through 2040

Type (Cost/Benefit)	Project Phase	Line Item	$ / hour	$ / unit	Man hours & Units Combined	Cost/Benefit per year					Year 1-10 Subtotal	Item Remarks
						Year 0	Year 1	Year 2	Year 9	Year 10		
Cost, tangible	R&D	Throughput research and analysis	$ 225.00	$ -	180	$ 40,500.00	$ -	$ -	$ -	$ -	$ -	Priced at 3 Engineers for 2 Weeks
Cost, tangible	R&D	Generation Site survey	$ 0.25	$ -	500,000	$ 125,000.00	$ -	$ -	$ -	$ -	$ -	Satelite survey estimates there is roughly 500,000 sq. ft of space for solar panels
Cost, tangible	R&D	Climate analysis	$ 250.00	$ -	16	$ 4,000.00	$ 4,000.00	$ 4,000.00	$ -	$ -	$ 12,000.00	Analyze climate needs for solar system
Cost, tangible	R&D	Solar panel system design	$ 275.00	$ -	180	$ 49,500.00	$ -	$ -	$ -	$ -	$ -	Design solar system
Cost, tangible	R&D	Power distribution and charger placement design	$ 275.00	$ -	180	$ 49,500.00	$ -	$ -	$ -	$ -	$ -	Design distribution system with chargers
Cost, intangible	R&D	Finance discussions	$ 225.00	$ -	60	$ 13,500.00	$ -	$ -	$ -	$ -	$ -	Discuss project finances and funding
Cost, intangible	R&D	Site visits, travel, and other incidental design expenses	$ -	$ -	10,000	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ -	$ -	$ 20,000.00	
Cost, tangible	BOM	Solar panels (with mounting trusses)	$ -	$ 9.00	500,000	$ 4,500,000.00	$ -	$ -	$ -	$ -	$ -	Based off of need for 500,000 sq. ft of solar panels per the site survey
Cost, tangible	BOM	Distribution cable	$ -	$ 10.00	72,000	$ 720,000.00	$ -	$ -	$ -	$ -	$ -	Based off of need for 60,000 ft of cable + 20% for incidentals and a lack of actual engineering knowledge
Cost, tangible	BOM	Charging stations	$ -	$ 75,000.00	5	$ 375,000.00	$ -	$ -	$ -	$ -	$ -	Based off of need for 5 chargers
Cost, tangible	BOM	Fire supression equipment at chargers	$ -	$ 5,000.00	5	$ 25,000.00	$ -	$ -	$ -	$ -	$ -	Based off of need for 5 chargers
Cost, tangible	Construction	Civil site preperation labor (concrete footings, electrical buildings, etc.)	$ 40.00	$ -	7,200	$ 288,000.00	$ -	$ -	$ -	$ -	$ -	
Cost, tangible	Construction	Electrician labor (Solar panel wiring, distribution cables, charger hookup)	$ 40.00	$ -	12,000	$ 480,000.00	$ -	$ -	$ -	$ -	$ -	
Cost, tangible	Construction	Incidental expenses	$ -	$ -	200,000	$ 200,000.00	$ -	$ -	$ -	$ -	$ -	
Cost, tangible	Personnel training	System overview, operation, and maintenance training	$ 30.00	$ -	2,000	$ 60,000.00	$ -	$ -	$ -	$ -	$ -	
Cost, tangible	Personnel training	Yearly training and education	$ 30.00	$ -	1,000	$ 30,000.00	$ 30,000.00	$ 21,000.00	$ 1,729.44	$ 1,210.61	$ 97,175.25	
Cost, tangible	Maintenance	Panel cleaning	$ 25.00	$ -	1,000	$ 25,000.00	$ 25,000.00	$ 25,000.00	$ 25,000.00	$ 25,000.00	$ 250,000.00	
Cost, intangible	Maintenance	Charger maintenance	$ 40.00	$ -	640	$ 25,600.00	$ 25,600.00	$ 25,600.00	$ 25,600.00	$ 25,600.00	$ 256,000.00	
Cost, intangible	Maintenance	2% solar panel failure replacement cost	$ -	$ 6.00	2,500	$ -	$ -	$ -	$ 15,000.00	$ 15,000.00	$ 90,000.00	
				Total System Cost		**$ 7,020,600.00**	**$ 94,600.00**	**$ 85,600.00**	**$ 67,329.44**	**$ 66,810.61**	**$ 725,175.25**	

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Benefit, tangible	System usage	Electircity sold to airlines(2MWH/year)		$ 100,000.00		$ -	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 1,000,000.00	
Benefit, intangible	System usage	Workplace safety improvements due to less jet fuel	$ 65.00	$ -	490	$ -	$ 31,850.00	$ 31,850.00	$ 31,850.00	$ 31,850.00	$ 318,500.00	No employee present when fuel is there, we assume savings of refuel time is 70%.
Benefit, intangible	System usage	Reduced CO2 from planes	$ -	$ 50.00	1,050	$ 52,500.00	$ 52,500.00	$ 52,500.00	$ 52,500.00	$ 52,500.00	$ 525,000.00	3000lb of CO2/flight at 700 flights per year yields 1050t of CO2 per year.
Benefit, intangible	System usage	Green energy for airport buildings	$ -	$ 40,000.00	-	$ -	$ 40,000.00	$ 40,000.00	$ 40,000.00	$ 40,000.00	$ 400,000.00	
Benefit, intangible	System usage	More stable day to day operations/cost (less reliant on fuel prices)	$ -	$ 35,000.00		$ -	$ 35,000.00	$ 35,000.00	$ 35,000.00	$ 35,000.00	$ 350,000.00	Access to a stable energy source encourages airlines to use the site
Benefit, tangible	Public relations	Creates diverse job market	$ -	$ 50,000.00		$ -	$ 50,000.00	$ 50,000.00	$ 50,000.00	$ 50,000.00	$ 500,000.00	
Benefit, intangible	Public relations	Creates emergency acess to transportation during fuel shortage	$ -	$ 10,000.00		$ -	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 10,000.00	$ 100,000.00	
Benefit, intangible	Public relations	Improved public opinion of airport	$ 40.00		15,000	$ 600,000.00	$ 600,000.00	$ 600,000.00	$ 600,000.00	$ 600,000.00	$ 6,000,000.00	Expecting people to spend $40 more at airport because of EA
Benefit, intangible	Public relations	Reduced risk of fuel accidents/spills	$ -	$ 12,000.00		$ -	$ 12,000.00	$ 12,000.00	$ 12,000.00	$ 12,000.00	$ 120,000.00	Improved workplace safety
				Benefit Subtotals		**$ 652,500.00**	**$ 931,350.00**	**$ 931,350.00**	**$ 931,350.00**	**$ 931,350.00**	**$ 9,313,500.00**	