

Marketing Plan

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I. Executive Summary

Solar photovoltaic systems in Greece is an emerging market encouraged by favorable laws, regulations, and financing of the Greek government and the European Union. Greece is an excellent market for solar photovoltaic systems for residential use due to its relatively high per capita income, its membership in the European Union and the Euro, its geographic properties that make it more difficult to provide electricity from a central grid system, and its favorable weather conditions.

II. Product Description and Characteristics

Our core product of choice is the ASTROPower's SunUPS™ Solar Electric Power Systems with AP-100 Modules. SunUPS Systems provide a total solution packet for generating clean electricity at home, requiring minimal reliance on other suppliers or distributors. The system requires installation by company trained and certified electricians. Here's a quick list of components included in the SunUPS™ System and a brief description of the component's function:

- Solar Panels..... Converts sunlight into DC electrical power
- Inverter..... Converts DC power to AC power for use at home
- Battery Storage..... Provides energy during electrical outages or at night
- Electrical Circuit Panel.. Used for conserving energy during electrical outages or at night by limiting electricity to essential loads

ASTROPower is a Newark, Delaware based company in the United States with a manufacturing facility in Spain, and a Far East Office in Singapore. The relatively small company size of ASTROPower compared to other giants in the solar panel production market such as BP Solar, Siemens Solar, Solarex, Photowatt and Kyocera allow greater flexibility and a wide array of branding and product positioning possibilities. Production in Spain adds a further layer of cost savings since the system will not require an additional converter needed for systems produced for

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use in the US market. While voltage (V), and frequency (Hz) requirements do differ between US and Greece, the same requirements are identical between Greece and Spain. Therefore only minimal adaptation of the product may be necessary, without a need for an additional converter to switch US's 110V 60Hz to Greece's 220V 50Hz.¹

III. Country – Target – Market Analysis

A. Political Issues and Situation

Greek Ministry of Development with the authority of the Development Law subsidizes up to 40% of the initial cost of commercial photovoltaic system installations. In addition tax deductions of up to a 100% and an additional subsidy of up to 40% of the interest incurred in setting up the photovoltaic system is available from the Greek government.² Other favorable conditions for photovoltaic systems in the Greece are based on Public Power Corporations (PPC) policy for buying all excess energy produced by photovoltaic solar energy systems, which are tied to the electricity grid. PPC pays up to 90% of the retail price of electricity for the excess energy it purchases from the consumer.³ Data indicates that photovoltaic solar energy systems can produce nearly one-third of the energy required for consumption in Greece.⁴

Greece has demonstrated political willpower in funding projects related to solar energy utilization, and does not seem to be tied down to arguments, which suggest solar power is still in its infancy, or it is too soon for any practical applicability. Perhaps one of the best examples of government's support for the new technology is the solar photovoltaic powerstation, which

¹ [Anonymous], "Electric Power Around the World" [Steve Kropla's Help for World Travelers], 06 April 2003 [cited 14 April 2003]; available from <http://www.kropla.com/electric2.htm>. Volt is the strength of the current. Frequency is the measure of rapidness of each alternating pulse in an AC system.

² [Anonymous], "The Photovoltaics Market in Greece" [Hellenic Association of Photovoltaic Companies], [cited 11 April 2003]; available from <http://www.helapco.gr/library/The%20PV%20Market%20in%20Greece-eng.pdf>.

³ Ibid.

⁴ Ibid.

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was set up in Crete, Greece with funding from the Greek government and the European Union with 55% of the cost of the project. The photovoltaic power station will be one of the largest photovoltaic electric generating plant in the world.⁵

B. Economic Data and Conditions

According to the World Development Indicators, Greece has the 31st largest economy in the world⁶, with a real GDP of approximately hundred fifty one billion dollars, calculated by the purchasing power parity method. Greece's real GDP per capita reaches a relatively high \$14,250, perhaps due to the size of a small population of a little over 11 million people.⁷ Income distribution is fairly equal, and moreover, the per capita figure estimates for 2002 may be as high as \$19,000. Service sector is the largest segment in the Greece's economy, with 15% of GDP derived from tourism. Macroeconomic data shows that 64.4% of Greece's GDP and 56.2% of employees are part of the service segment. A closer look into energy production and consumption in Greece demonstrates interesting realities for the overall benefits of investing in renewable energy sources. As in many other countries in Europe, Greece imports petroleum products, such as diesel oil used in running generators, which provide electricity for some of the islands. Hence, a greater usage of renewable energy sources thru systems manufactured at home may mean a decent improvement on reducing the trade deficit for Greece, a country that imports 31% more than its exports in goods and services combined.

C. Social/Cultural Issues and Situation

Efficiency of solar energy panels is an ongoing concern and a still the conventional wisdom, which need to be abandoned thru education. Preliminary trials of solar energy usage in the

⁵ [Anonymous], "Crete to Build 50-MW PV Plant," *Utility Environment Report*, 9 April 1999, 11.

⁶ Vern Terpstra & Lloyd Russow, *International Dimensions of Marketing* (Ohio: South-Western College Publishing, 1999), 32.

⁷ [Anonymous], "2003 Country Review" [Country Watch], [cited 14 April, 2003]; available from http://www.countrywatch.com/cw_country.asp?vCOUNTRY=67.

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island of Kithnos shows that energy generated from solar power is less costly than buying diesel oil to power the generators on the island. The government is certainly on board with the new trend for investment in renewable energies: "Officials of the state Public Power Corporation say it now costs the equivalent of 21 cents to generate a kilowatt of power on Kithnos, compared with \$2.83 on the small island of Anti-Kithira nearby."⁸

D. Demographic and Consumer Information

Greece is a country with little over 11 million people.⁹ Age distribution shows favorable conditions for sale of photovoltaic systems: 35% of the Greek population fit perfectly within our target group of customers who are 30-60 years of age.¹⁰ Two customer psychographic profiles describe a typical residential buyer of solar energy systems. Environmental conscious individuals have a relatively high income, and they have moderate to high level of dissatisfaction with their existing electricity provider. Sources of dissatisfaction may be electricity shortages, or environmental concerns. Those-in-need have low or moderate level of income, and they live in an isolated area where electricity is not readily available, or in the case of Greece, most likely too costly than a solar alternative. Electricity outages in Greece are not a frequent problem, and existing solar installations are small systems, and solar water heaters.

E. Market- Customer Information Related to Product (who buys what, when, where, how, and why)

While most photovoltaic solar energy systems are off-grid, stand-alone systems, approximately 40% of all installations in the market are indeed tied to the public electricity grid for resale of access energy produced to the Public Power Corporation.

⁸ Patrick Quinn, "Sun, wind, harnessed in the isles of Greece," *The Toronto Star*, 12 December 1992, D6.

⁹ [Anonymous], "2003 Country Review" [Country Watch], [cited 14 April, 2003]; available from http://www.countrywatch.com/cw_country.asp?vCOUNTRY=6Z.

¹⁰ [Anonymous], "IDB Summary Demographic Data for Greece" [U.S. Census Bureau], 10 October 2002 [cited 16 April 2003]; available from <http://blue.census.gov/cgi-bin/ipc/idbsum?cty=GR>

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Residential consumers who do not have electricity grid have the most to benefit from the purchase of photovoltaic solar energy systems: “The installation of photovoltaic systems in houses with no access to the electricity grid is often more economical compared to the connection cost with the electricity company.”¹¹ Greece’s geographic features, namely the fact that it is made up of 2000 islands in addition to the mainland, make it especially difficult for many homes to be connected to the main electricity grid.¹² Home which are already tied to the electricity grid demand photovoltaic solar energy installation for gaining partial independence from the electricity company, in order to avoid higher future prices or sudden power interruptions.¹³

F. Market Trends

Figures by the Hellenic Association of Photovoltaic Companies indicate that in the last five years cumulative photovoltaic power installations in Greece have more than tripled, an increase of approximately 240%.¹⁴

With increasing demand, we can anticipate increasing local manufacturing of photovoltaic systems in Greece in addition to the exported systems that are currently in the marketplace today. The first photovoltaic manufacturing plant has already been established in Kilikis near Macedonia with 40% funding by European Union funds, approved by Greece’s Ministry of National Economy. The remaining 60% of funds are provided by Heliiodomi S.A., a joint

¹¹ [Anonymous], “Photovoltaic Applications in Houses” [Heliiodomi], [cited 13 April 2003]; available from <http://www.heliiodomi.gr/en/ef02.html>.

¹² [Anonymous], “Greece- Geography” [CIA The World Fact Book 2002], 19 March 2003 [cited 16 April 2003]; available from <http://www.cia.gov/cia/publications/factbook/geos/gr.html>.

¹³ [Anonymous], “Photovoltaic Applications in Houses” [Heliiodomi], [cited 13 April 2003]; available from <http://www.heliiodomi.gr/en/ef02.html>.

¹⁴ [Anonymous], “The Photovoltaics Market in Greece” [Hellenic Association of Photovoltaic Companies], [cited 11 April 2003]; available from <http://www.helapco.gr/library/The%20PV%20Market%20in%20Greece-eng.pdf>.

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venture of New Jersey, US based Energy Photovoltaics, Inc. and Themeliodomi SA of

Thessaloniki, Greece.¹⁵

IV. Product Marketing Plan (Be Specific)

A. Product Positioning and Placement in Market and Overall Strategy

Perhaps the greatest rival to our success in Greece is the local manufacturer of photovoltaic systems, Heliodami S.A. Earliest manufacturing planned by Heliodami is set for 2004. In addition, Heliodami largely focuses on production and sale of big systems and modules for commercial, and agricultural use.

By positioning ourselves in the niche market of single-household residential solar energy systems we can capitalize on efficiencies, which are not available to existing distributors or retailers. In order to distinguish our service and product bundle, we must focus on being known as a provider of total solutions at low costs. Our overall strategy must focus on residential homes, or small retail structures requiring minimal electricity demand. In educating potential customers thru our advertising, we must emphasize simplicity, and efficiency first, and only sublimely the benefits of the solar panel systems to the environment. As part of this strategy, we must always remain in touch with various government rebates, tax incentives or buy-back programs which reduce the pay-back period of the investment to the customer.

B. Export – Import Information

Solar panels from Spain will encounter a minimal level of scrutiny for gaining entry into Greece. While many regulations still exist for importing food and agricultural products. Office of United States trade representative reports various regulations for bids submitted for public

¹⁵ Dolores Phillips, "EPV Enters European JV with Themeliodomi" [National Center for Photovoltaics], 23 July, 2001 [cited 10 April 2003]; available from http://www.nrel.gov/ncpv/hotline/07_01_jv.html.

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utility projects, which favor EU companies over those based in the United States. Same report writes: "Greece restricts private investment in public utilities."¹⁶ Neither one of these two barriers cited should cause alarm because while solar energy systems do provide electricity, they are not considered investments in public utility grid, and bidding is not necessary for sale of these systems to our target market of residential households.

Shipping regulations from Spain to Greece of any of the components of the photovoltaic system require a commercial invoice since the items are intended for resale. In the commercial invoice seller and purchaser information, country of origin, description of each item being shipped, including harmonized codes, commercial value of the item being shipped, and reason for export.¹⁷

C. Product Distribution and Suppliers – Wholesalers, Agents, Retailers, Warehousing

Perhaps the only way to provide the total package SunUPS™ solar solutions bundle is thru direct exporting. Local retail branches and district electric technicians with a JIT system for both the actual components of SunUPS™ and the electric and setup expertise will most likely be the best combination. Because SunUPS™ is a new concept, local presence is necessary for Greece, a market place that still places a value on personal interaction rather than purchases thru the Internet or the phone. The customization required in the installation of the system also demands a forward presence in the marketplace.

D. Promotion – Advertising, Sales, Publicity

Advertising plays a critical role in the Greece where it makes up 1.61% of Greece's GNP, compared to 1.38% in UK or 1.00% in Germany.¹⁸ A 97% literacy rate in Greece encourages

¹⁶ [Anonymous], "European Union" [Office of the U.S. Trade Representative], [cited 16 April 2003]; available from <http://www.ustr.gov/reports/nre/1997/eurounionio.pdf>.

¹⁷ [Anonymous], "Export Documentation [UPS Greece], [cited 16 April 2003]; available from <http://www.ups.com/europe/gr/using/services/export/engxpintro-guide.html>.

¹⁸ Terpstra & Russow, 173.

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us to pay close attention to the print media, especially for communicating our message to 40-60 age bracket.¹⁹

E. Pricing

ASTROPower's SunUPSTM Solar Electric Power System's cost to a residential buyer in the United States is \$15,000, including on-site consultation, service, and installation. Price of the components only will be \$10,000, assuming a system capable of meeting the maximum 2kWh energy consumption of a single family dwelling. In order to generate the 2kWh energy demand, the system ought to have around sixteen solar panels, each providing 120 watts of electricity with a price tag of \$500 per panel.

Two market adjustments can be made in order to sell the system at a lower price point in Greece, a market with a per capita income around half that of the United States. First, consultation, service, and installation costs can be slashed to around \$3,200, keeping in mind the lower salary costs of the operation in Greece. Second, taking into consideration the average size homes in Greece smaller than those in the United States, fewer electricity demands may bring down the cost related to the actual solar panels required in the system. With these considerations in mind, retail price in Greece ought to be \$10,000, down from \$15,000 in the United States for system of similar function.

V. Sales Estimate and Forecast (for three years)

Four basic assumptions play a key role in our calculations. First, we will assume that in 15 years, solar energy panel usage will indeed provide for 1/3rd of the energy demand in Greece based on information provided by Heliiodomi. Our second assumption is that residential consumption is approximately 35% of overall energy consumption in Greece. Third, we must assume our

¹⁹ [Anonymous], "Greece- Geography" [CIA The World Fact Book 2002], 19 March 2003 [cited 16 April 2003]; available from <http://www.cia.gov/cia/publications/factbook/geos/gr.html>.

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product is a key player in the residential market, where a minimum of 50% of the solar energy systems are ASTROPower's SunUPSTM Solar Electric Power Systems. Lastly, we will assume a 2.5% rate of increase in electricity consumption in Greece.²⁰ With these assumptions in mind, following is the sales forecast of this system for three years:

Year	Sales Estimate	Sales Forecast
2004	25	\$250,000
2005	36	\$360,000
2006	48	\$480,000

VI. Conclusions

Study shows Greece is a favorable market of entry for a medium size company with an established name as ASTROPower. Government regulations, and country's demographic and geographic properties mean a profitable small scale operation in Greece is indeed possible.

²⁰ [Anonymous], "Greece- Geography" [CIA The World Fact Book 2002], 19 March 2003 [cited 16 April 2003]; available from [Anonymous], "Climate Change" [National Observatory of Athens]; [cited 15 April 2003] available from http://www.climate.noa.gr/Reports/CC_reports3rd1.htm.

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[Anonymous], "Electric Power Around the World" [Steve Kropla's Help for World Travelers], 06 April 2003 [cited 14 April 2003]; available from <http://www.kropla.com/electric2.htm>. Volt is the strength of the current. Frequency is the measure of rapidness of each alternating pulse in an AC system.

[Anonymous], "European Union" [Office of the U.S. Trade Representative], [cited 16 April 2003]; available from <http://www.ustr.gov/reports/ntr/1997/eurounio.pdf>.

[Anonymous], "Export Documentation [UPS Greece], [cited 16 April 2003]; available from <http://www.ups.com/europe/gr/using/services/export/engexpintro-guide.html>.

[Anonymous], "Greece- Geography" [CIA The World Fact Book 2002], 19 March 2003 [cited 16 April 2003]; available from <http://www.cia.gov/cia/publications/factbook/geos/gr.html>.

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[Anonymous], "The Photovoltaics Market in Greece" [Hellenic Association of Photovoltaic Companies], [cited 11 April 2003]; available from <http://www.helapco.gr/library/The%20PV%20Market%20in%20Greece-eng.pdf>.

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