APOLLO SOLAR ENERGY, INC.
Form 10-K
March 31, 2010

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934.

For the fiscal year ended: December 31, 2009

TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from _____ to _____

Commission File Number: 0-12122

Apollo Solar Energy, Inc.

(Exact name of registrant as specified in its charter)

Nevada	84-0601802
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

No. 485 Tengfei Third,
Shuangliu Southwest Airport
Economic Development Zone,
Shuangliu, Chengdu
People's Republic of China, 610207
(Address of principal executive offices)

Registrant's Telephone Number, Including Area Code: +86 (755) 2580-1888

Securities Registered Pursuant to Section 12(b) of the Act:

Title of Each Class	Name of Each Exchange on Which Registered
Common Stock, $0.001 par value	OTCBB

Securities Registered Pursuant to Section 12(g) of the Act: None.

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes o No ý

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act.
Yes o No ý

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ýNo o

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes £ No £

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. o

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer	o	Accelerated filerý
Non-accelerated filer	o	Smaller reporting companyo
(Do not check if a smaller reporting company)		

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes o No ý

The aggregate market value of the voting and non-voting common equity held by non-affiliates of the registrant on June 30, 2009 (the last business day of the registrant's most recently completed second fiscal quarter), was $144,201,466 based on the closing price of the registrant's common stock on the Over-the-Counter Bulletin Board, or the OTCBB, of $5.35 per share.

There were 44,555,131 shares of common stock outstanding as of March 30, 2010.

DOCUMENTS INCORPORATED BY REFERENCE: The information required by Part III of Form 10-K is incorporated by reference from the Registrant's definitive proxy statement on Schedule 14A that will be filed no later than the end of the 120-day period following the Registrant's fiscal year end, or, if the Registrant's definitive proxy statement is not filed within that time, the information will be filed as part of an amendment to this Annual Report on Form 10-K, not later than the end of the 120-day period.

APOLLO SOLAR ENERGY, INC.

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For the Fiscal Year Ended December 31, 2009

CAUTIONARY STATEMENT REGARDING FORWARD-LOOKING STATEMENTS

The information contained in this Form 10-K, including in the documents incorporated by reference into this Form 10-K, includes some statements that are not purely historical and that are "forward-looking statements." Such forward-looking statements include, but are not limited to, statements regarding the Company and its management's expectations, hopes, beliefs, intentions or strategies regarding the future, including its financial condition, and results of operations. In addition, any statements that refer to projections, forecasts or other characterizations of future events or circumstances, including any underlying assumptions, are forward-looking statements. The words "anticipates," "believes," "continue," "could," "estimates," "expects," "intends," "may," "might," "plans," "possible," "potential," "predicts" "should," "will," "would" and similar expressions, or the negatives of such terms, may identify forward-looking statements, but the absence of these words does not mean that a statement is not forward-looking.

The forward-looking statements contained in this Form 10-K are based on current expectations and beliefs concerning future developments and the potential effects on our Company's business. There can be no assurance that future developments actually affecting us will be those anticipated. These forward-looking statements involve a number of risks, uncertainties (some of which are beyond our control) or other assumptions that may cause actual results or performance to be materially different from those expressed or implied by these forward-looking statements, including the following:

- Vulnerability of our Company's business to general economic downturns;
- Fluctuation and unpredictability of costs related to the precious metals and other commodities used to make our products;
- Changes in the laws of the People's Republic of China, or the PRC, that affect our operations;
- Competition from our competitors;
- Any recurrence of earthquakes in the areas where we operate;
- Our ability to obtain all necessary government certifications and/or licenses to conduct our business;
- Development of a public trading market for our securities;
- The cost of complying with current and future governmental regulations and the impact of any changes in the regulations on our operations;
- Fluctuation of the foreign currency exchange rate between U.S. Dollars and Renminbi, or RMB, the lawful currency of China; and
- The other factors referenced in this Form 10-K, including, without limitation, under the sections entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations," and "Business."

These risks and uncertainties, along with others, are also described below under Item 1A, “Risk Factors.” Should one or more of these risks or uncertainties materialize, or should any of our assumptions prove incorrect, actual results may vary in material respects from those projected in these forward-looking statements. We undertake no obligation to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, except as may be required under applicable securities laws.

Unless the context otherwise requires, the terms “we,” the “Company,” “us,” or “Apollo” refers to Apollo Solar Energy, Inc and our wholly-owned subsidiaries and variable interest entities.

PART I

ITEM 1. BUSINESS

Overview

We are a China-based vertically integrated refiner of tellurium, or Te, and high-purity tellurium-based metals for specific segments of the electronic materials market. Our main expertise is in the production of Te-based compounds used to produce thin-film solar cells, cell modules and solar electronic products. The tellurium used in our products will be primarily sourced from our wholly-owned Dashuigou mine located in Sichuan Province, PRC. In addition we source tellurium from another mine in Shimian, Majiagou, PRC, through variable interest entity agreements, or the VIE Agreements, executed in April, 2009, with Sichuan Xinju Mineral Resources Development Corporation and certain of its shareholders holding 51.6619% of its voting stock, which shareholders are our direct or indirect employees. Under the terms of the VIE Agreements, we have been granted the exclusive exploration and mining rights to the Majiagou mine, or the VIE Arrangement, in accordance with a license granted by the Chinese government, which extends through January, 2013, subject to potential renewal thereafter.

Currently, tellurium is produced as a product in the process of processing copper and other metals. As a result, costs are high. We believe that the Dashuigou and Majiagou mines are the only two known deposits in the world in which tellurium, one of the rarest metallic elements on earth, is the primary commodity of economic interest. By the end of 2010, we plan to obtain approximately 60% to 70% of the tellurium necessary for our products from the Dashuigou and Majiagou mines and believe this ability to be a significant competitive advantage because the cost of tellurium sourced from our own mines will be substantially lower than that purchased from an outside third party. We will source the remaining 30% to 40% of our tellurium needs from third-party suppliers with whom we have established good business relationships with over the past few years. By vertically integrating our processes, we believe we are able to achieve significant operating efficiencies and produce high-quality products that offer cost and quality benefits to our customers. Currently, we are able to procure raw materials from the Dashuigou and Majiagou mines at a significant discount to prevailing market price.

Our refining operations are currently based in a 330,000 square foot facility in Chengdu, Sichuan Province, PRC. We expect this facility to eventually have the capacity to produce more than 300 tons of high-purity photovoltaic cell materials and 42 other types of electronic materials. Future expansion of this facility in vacant land leased to the Company will have a capacity to produce up to an additional 350 tons of high-purity photovoltaic cell materials.

We believe we are unique in that we expect to both mine and refine our tellurium-based products, with primary refining capabilities as provided by Sichuan Xinju Mineral Resources Development Corporation pursuant to the VIE Agreements, and secondary refining capabilities directly through our Company. Our primary refining capabilities are such that we can treat metal concentrates (containing, for example, as little as 50% of the metals of interest), and extract and refine the metals of interest so that they can be fed to our secondary refining operations, where we attain a higher level of purity. Because we will mine the raw material, and perform both refining functions, directly and through our VIE Arrangement, we consider ourselves a supplier with uniquely integrated capabilities. Our end-products are tellurium, cadmium, zinc and related compounds of 99.999% (five nines, or 5N) purity or above. Our products are critical precursors in a number of electronic applications, including the rapidly-expanding thin-film photovoltaic, or PV, market.

Thin film technologies, because of their relatively low usage of raw materials when compared with traditional silicon-based photovoltaic technologies, offer a potential cost advantage in the marketplace. Accordingly, we believe these technologies are beginning to gain an ever increasing foothold in the market.

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Our Variable Interest Entity Agreements

As illustrated in the diagram below, we entered into various exclusive contractual arrangements on April 10, 2009 with Sichuan Xinju Mineral Resources Development Corporation, or the VIE, and certain of its shareholders who are our direct or indirect employees and who collectively own 51.6619% of the VIE. Among other things, these VIE Agreements granted to our wholly-owned subsidiary a first option to purchase the exploration rights related to the Dashuigou area mine and the mining rights related to that certain tellurium and bismuth mine in Shimian Majiagou, which rights we collectively referred to as the Mining Business. Additionally, the VIE and certain of its shareholders who collectively own 51.6619% of the VIE granted to our wholly-owned subsidiary an exclusive right to purchase all of the products produced from the Mining Business for a specified period of time. As a result, we consolidate the financial results of the VIE related to the Mining Business pursuant to FASB ASC 810-10, “Consolidation.”

(1) Agreements that provide us with effective control over Sichuan Xinju Mineral Resources Development Co. Ltd., or the VIE, include a purchase option agreement, a business operations agreement and an exclusive technical and consulting agreement.

The agreements between the VIE and our other affiliated entities or persons are summarized below:

- First Option Exclusive Acquiring Agreement, between Sichuan Xinlong Tellurium Industry & Technique Co., Ltd., Sichuan Xinju Mineral Resources Development Co., Ltd., Renyi Hou and Ling Yong, which grants to our wholly-owned subsidiary a first option to purchase the Mining Business at such time as the purchase becomes advisable, permissible and in our best interest.

- Exclusive Sales Agreement, between Sichuan Xinlong Tellurium Industry & Technique Co., Ltd. and Sichuan Xinju Mineral Resources Development Co., Ltd., which grant to our wholly-owned subsidiary the exclusive right to buy all of the output of the Mining Business.

- Business Operation Agreement, between Sichuan Xinlong Tellurium Industry & Technique Co., Ltd., Sichuan Xinju Mineral Resources Development Co., Ltd., Renyi Hou and Ling Yong, which imposes certain restrictions and obligations on the VIE and certain of its shareholders to support the VIE arrangement, including refraining from competing with our business and modifying the business operations of the VIE without the prior consent of our wholly-owned subsidiary.

- Exclusive Technical and Consulting Agreement, between Sichuan Xinlong Tellurium Industry & Technique Co., Ltd. and Sichuan Xinju Mineral Resources Development Co., Ltd., which requires the VIE to provide certain technical and consulting services exclusively to our wholly-owned subsidiary in connection with the Mining Business. Our wholly-owned subsidiary agrees to provide up to $6.0 million in investing funding to the VIE in connection with its operation of the Mining Business, on such terms as the parties shall agree from time to time.

Renewable Energy Industry

The demand for electricity is steadily increasing as the worldwide economy continues to grow. Global electric power generation is expected to reach 25,000 terawatt hours, or TWh, annually by 2020, according to the Energy Information Administration, or the EIA, of the United States government, up from 17,000 TWh in 2005. According to a study by the European Commission, the market volume is expected to increase to approximately $53 billion by the end of 2010.

To meet this increasing demand, significant investments are required to ensure that the availability of fossil fuels, which account for approximately 65% of the world's supply of electricity, is maintained. However, fossil fuels face a number of challenges that limit their availability and result in significant price pressures. The limited availability and rising cost of fossil fuels have stimulated the development of renewable energy technologies and created, in our view, a significant business opportunity.

The challenges facing fossil fuels are creating a growth opportunity for renewable energy. Renewable energy sources for electric power generation include hydroelectric, biomass, geothermal, wind and solar. Among renewable sources of electricity, we believe solar energy has the most potential to meet the world's growing electricity needs. According to the U.S. Department of Energy, the sun is the only source of renewable energy that has a large enough resource base to meet a significant portion of the world's electricity needs. A study commissioned in 2002 by the U.S. Department of Energy estimated that, on average, 120,000 trillion Watts, or TW, of solar energy strike the Earth per year, far exceeding the global electricity consumption rate of 14.3TW. At a typical latitude for the United States, a net 10% efficient solar energy "farm" covering 1.6% of the U.S. land area could theoretically meet the country's entire domestic electricity needs.

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Photovoltaic Systems

Solar electricity is generated using either photovoltaic or solar thermal technology to extract energy from the sun. Photovoltaic, or PV, electricity generating systems directly convert the sun's energy into electricity, whereas solar thermal systems heat water or other fluids that are then used as sources of energy. PV systems are either grid-connected systems or off-grid systems. Grid-connected systems are connected to the electricity transmission and distribution grid and feed solar electricity into the end-user's electrical system and/or the grid. Such systems are commonly mounted on the rooftops of buildings, integrated into building facades or installed on the ground using support structures, and range in size from 2-3 kilowatts to multiple MWs. Off-grid PV systems are typically much smaller and are frequently used in remote areas where they may be the only source of electricity for the end-user. PV systems are currently the most widely used method of transforming sunlight into electricity.

In an overview of PV market potential, ECN Solar Energy reported in 2008 that the PV sector has grown at a rate of 25% per annum over the preceding two decades and at a rate of 45% per annum over the preceding five years. According to Photon Consulting, a global solar energy research firm, the PV market is expected to grow at approximately this rate for the next several years. The current installed worldwide PV-power generation capacity (that is, the number of installed modules multiplied by their average power rating), is still relatively marginal, representing slightly more than 8 gigawatts in 2006. Although this corresponds to only 0.06% of global electricity consumption, a 2007 report by Photon Consulting suggests that mass substitution by PV modules has begun. In particular, the report predicts that by 2011, PV will represent 10% to 15% of the annual additions of electricity generating capacity and that in selected countries the annual solar capacity additions will exceed those of coal and nuclear energy.

Thin Film Photovoltaic Technologies

Approximately 80% of PV-generated electricity is currently produced using traditional crystalline silicon. This technology requires a significant amount of high-purity silicon. The increase in PV production has resulted in a shortage of this type of silicon, adversely affecting PV growth and costs. Recently, because of over-capacity in silicon wafer, cost of traditional PV has come down significantly. However, thin-film technologies based on either amorphous silicon or Cadmium telluride (CdTe) are rapidly being phased into production because of their potential for further lowering the cost of PV modules. This is largely due to the fact that thin-film-based modules, as their name implies, consume much smaller amounts of the foregoing starting materials, typically only 1% compared to crystalline silicon, and also because they are produced using a continuous manufacturing process which is mass production proven. Additionally, thin film technologies are inherently free from the supply constraints associated with traditional silicon-based photovoltaic technologies, thus offering additional cost advantage in the marketplace. Accordingly, we believe these technologies are beginning to gain a foothold in the market.

Strategy

We seek to become the leading global provider of both high-purity metals and PV products by taking advantage of our high degree of vertical integration, which we believe yields economies of scale and cost savings. We consider ourselves uniquely positioned in China among suppliers of high-purity materials because of our exclusive access to the Dashuigou and Majingou mines. A key element of our strategy is to increase our shipments globally and, in the longer term, become a leading producer of CdTe thin-film solar modules.

Our strategy includes the following key elements:

· · Leverage our cost base. We believe the technical improvements resulting from our research and development efforts have been instrumental in significantly reducing our production costs and increasing our operational efficiency. As we source more tellurium internally, we believe we will be

able to achieve significantly higher profit margins than our competitors. We intend to utilize this cost advantage to attract both new customers and larger orders from existing customers.

· · Increase production capacity. The main constraint limiting our sales has been production capacity as customer demand has exceeded the amount of materials we are able to produce. In May 2008, we relocated our operations to a new 650,000 square foot facility in Chengdu, PRC and launched an aggressive expansion project to increase our annual production capacity of high-purity materials to 1,000 tons. Of these 1,000 tons, we plan to increase our capacity to produce tellurium and cadmium telluride. We will continue to closely monitor the progress of this expansion project to avoid risks of over-expansion, while evaluating other available expansion opportunities. We believe expansion of our production capacity is likely to result in greater economies of scale for our operations.

· Penetrate new market segments. Our current key markets are the United States and China, which represented our two largest markets based on revenues in 2009. We are seeking to increase sales in the United States and Japan and to expand into selected countries in Europe, where we believe the PV market is likely to grow significantly in the near term. For example, we entered into 6N sulfur supply contracts with several German companies, including Sulfurcell Solartechnit GmbH, during the last several years. We believe the visibility of our brand name in Germany will help us expand into our new targeted markets in Europe. We also seek to strengthen our relationships with existing customers, particularly with First Solar, CERAC and Honeywell. We also plan to hire additional sales agents to be based in Europe and the Middle East to provide services to our customers in those markets.

· · Expand market share in China. Although the PV market in China is currently smaller than other major PV markets, we believe that the adoption of a series of new laws, regulations and initiatives by the PRC government, including the PRC's Renewable Energy Law, the Supervision Regulations on the Purchase of All Renewable Energy by Power Grid Enterprises, the National Medium- and Long-Term Programs for Renewable Energy and the recent amendments to the PRC Energy-Saving Law demonstrates the PRC government's commitment to develop renewable energy sources and may lead to rapid growth in the PV market in China. As a leading supplier of high-purity materials in China, we believe we are well-positioned to capitalize on this growth and capture a significant portion of China's thin-film PV market.

Products

We produce and sell a range of metals and compounds to address the requirements of our customers in the various electronic materials market segments. Our range of products and their typical end-uses are as follows:

- Ultra-High Purity Tellurium. These include tellurium in purity levels of 99.999% (5N) to 99.99999% (7N) or more. High purity tellurium is used to manufacture radiation and infrared detectors;

- CdTe Thin Film Compounds. These are tellurium-based compounds in purity levels ranging from 99.999% (5N) to 99.9999% (6N). These products are primarily used in the production of thin-film solar electric power modules; and

- Other Commercial-Purity Metals. These include tellurium, selenium, antimony, bismuth, cadmium and zinc in purities ranging from 99.99% (4N) to 99.9999% (6N). These metals find applications in numerous electronic material market segments, including PV, radiation detector, and infrared detection.

Customers and Main Markets

Our principal customers are manufacturers of thin-film solar cells, cell modules, and solar electronic products. We also serve additional customers involved in various segments of other electronic materials markets. In 2009, approximately 90% of our sales were to two customers, First Solar and Shaoshan Metals in China. Although our sales will not be as heavily concentrated as in 2010, we still expect our sales to continue to be concentrated among a small number of customers. However, we also expect that our significant customers may change from time to time.

In 2009, 87% of our sales were made to customers in Asia and 13% of our sales were made to customers in North America. In 2008, 61% of our sales were made to customers in Asia, 38% of our sales were made to customers in North America and 1% of our sales were made to customers in the rest of the world. Our contracts with major customers are non-cancelable and provide for minimum levels of product sales for the duration of the contract (typically 6 to 12 months) with the potential for higher sales levels depending on such factors as rising market prices, customer’s needs, our available capacity and/or our ability to reach agreement on key terms. Our standard arrangement with First Solar is for 30-day payment terms.

As we expand our manufacturing capacity to include thin-film PV modules, we anticipate developing additional customer relationships with providers of solar systems to end-users that include individual owners of agricultural buildings, owners of commercial warehouses, offices and industrial buildings, public agencies and municipal government authorities that own buildings suitable for solar system deployment, owners of land designated as former agricultural land, waste land or conversion land, such as former military bases or industrial areas, and financial investors that desire to own large scale solar projects.

Our Customer Supply Agreements

In January 2009, we received purchase orders from First Solar to purchase nine tons of high purity Te. We negotiated with First Solar for additional orders in the second quarter in 2009. On January 8, 2009, we signed an agreement to appoint CERAC, Inc. as the exclusive distributor to sell our products in North America, excluding sales to First Solar. According to CERAC, there are delays in the development of CdTe based thin film PV panels by certain potential customers, which may not be remedied until mid 2010. We believe that once these new players are ready to produce,

we will be able to sell our products to them through the distribution network established by CERAC. We have also entered into monthly or semi-annual contracts with other customers including Pioneer Materials, Inc., Relden Crystals Inc., along with additional domestic companies.

Competition

We face competition from producers of raw materials such as Vital Chemicals Co., Xiandao (Qingyuan) Rare Metal and Chemical Co., and Emei Semiconductor Material Co. in China. Overseas we face competition from 5N Plus, Inc. in Canada, Honeywell Electronic Materials in the United States, PPM Pure Metals in Germany and Nikko Materials in Japan. As solar opportunities grow, new entrants are likely to enter the market and our existing customers may begin to backwards integrate. It is also likely that our current suppliers, who are large non-ferrous mining, refining and metal processing companies, will begin to vertically integrate as well. We believe that our complete vertical integration as both a miner and refiner will uniquely positions us to compete effectively.

Competitive Advantages

We believe that we possess significant competitive advantages. These advantages include:

- Well-Established Market Position and Significant Barriers to Entry. We believe that we are one of the main suppliers of cadmium, selenium, and tellurium metal and compounds in the markets that we serve. We believe we have a limited number of competitors due to the highly specialized nature of our business. The niche markets we serve require extensive expertise and know-how. Our products must be qualified by customers after long periods of testing. Most of the materials that we produce must also be handled with care because of their environmental and occupational impact, and must be recycled, all of which constitute significant entry barriers for potential competitors.

- Key Supplier in the Fast-Growing CdTe PV Industry. We are one of the key suppliers of CdTe to the PV industry, as evidenced by our relationship with First Solar, a leading CdTe PV module supplier. A significant increase in CdTe-based PV production capacity is expected over the next few years and we believe that we are well positioned to be an active participant in the growth of the industry.

- Stable Stream of Future Revenue. As we have exclusive access to tellurium, the issue of constant stable supplies to our customers does not exist. Therefore, we anticipate that we will be able to negotiate with all of our customers in the future for long-term supply agreements which will lead to stable stream of revenue in future years.

- Stable Supply of Critical Raw Materials at Competitive Pricing. We have the access to our own tellurium mines and to other sources of feedstock materials that we require. We consider ourselves uniquely positioned in China among suppliers of high-purity materials because of our exclusive access to the Dashuigou and Majiagou mines. We believe we can yield economies of scale and cost savings and thus offer highly competitive pricing to our customers.

Sales and Marketing

We market and sell our products through our direct sales force to customers in North America, Japan, the rest of Asia, and Europe. Our sales team consists of eight in-house sales managers and one sales director that we hired in December 2009. Our direct sales force includes experienced and technically sophisticated sales professionals and engineers who are knowledgeable in photovoltaics and the various applications in which our products are used. Our sales staff works with customers during all stages of the manufacturing process, from developing the precise composition of the compound through manufacturing and processing to the customer's exact specifications. On January 8, 2009, we appointed CERAC, Inc. to be our exclusive distributor for the North American market, excluding sales to First Solar. We believe we can leverage on CERAC's established distribution channel to sell products to customers that may begin production of their thin film PV modules in 2010.

A key component of our marketing strategy is developing and maintaining strong relationships with our customers, especially at the senior management level. We seek to achieve this through working closely with our customers to optimize our products for their production processes. In addition, we believe we are able to develop long-term relationships with key customers by offering competitive pricing, delivering high quality products and providing superior customer service. We believe that maintaining close relationships with senior management and providing necessary customer support improves customer satisfaction and provides us with a competitive advantage when selling our products.

In order to increase brand recognition of our products and of Apollo in general, we publish technical articles, advertise in trade journals, distribute promotional materials and participate in industry trade shows and conferences.

Research and Development

We plan to continue to devote a substantial amount of our resources to research and development with the objective of improving our mining output efficiency, and optimizing our extraction and refining steps. We will primarily focus our research and development in the following areas:

- Mining output efficiency. Mining is becoming increasingly sophisticated, with some mines now using smart sensors to identify areas to prospect, guide sophisticated equipment used in extracting minerals, and monitor air quality in mines. We are consistently seeking new technologies and techniques to raise efficiency at the Dashuigou and Majiagou mines while concurrently seeking to improve environmental and safety conditions.

- Mineral processing and refining. We are focusing our efforts on the optimization of both our front-end and back-end processes, namely our primary hydrometallurgical extraction and refining steps (leaching, solid liquid separation and electrowinning), as well as our secondary high-purity refining steps (vacuum distillation and zone refining).

As of December 31, 2009, our research and development team consists of 39 full-time employees which are broken down into four groups:

- Mineral resources prospecting and development, 20 engineers;
- Mineral processing, metallurgy, new materials, 6 engineers;
- New energy development, 8 engineers; and
- Geologists, 5.

Additionally, we have strategic research and development collaborations with various universities including Sichuan University, Chengdu Electronic Engineering University, Chengdu Polytechnic University, Shanghai Technical Physics Institute, China Nonferrous Metal Research Institute and the New Jersey Institute of Technology.

Intellectual Property

Our success depends, in part, on our ability to maintain and protect our proprietary technology and to conduct our business without infringing on the proprietary rights of others. As of December 31, 2009, we held eight Chinese patents with respect to our proprietary refining techniques and had an additional three patent applications pertaining to elements of our unique thin-film solar module manufacturing process pending.

With respect to proprietary know-how that is not patentable and processes for which patents are difficult to enforce, we rely on, among other things, trade secret protection and confidentiality agreements to safeguard our interests. All of our research and development personnel have entered into confidentiality and proprietary information agreements with us. These agreements address intellectual property protection issues and require our associates to assign to us all of the inventions, designs and technologies they develop during the course of employment with us. We also require our customers and business partners to enter into confidentiality agreements before we disclose any sensitive aspects of our refining techniques, solar modules, technology or business plans.

Environmental Regulations

Our Dashuigou and Majiagou mines and high purity material manufacturing facilities are subject to various pollution control regulations with respect to noise, water and air pollution and the disposal of waste and hazardous materials. The basic laws in China governing environmental protection in the mineral industry sector of the economy are the Environmental Protection Law, the Environment Impact Assessment Law and the Mineral Resources Law. The State Administration of Environmental Protection and its provincial counterparts are responsible for the supervision, implementation and enforcement of environment protection laws and regulations. Provincial governments also have the power to implement rules and policies in relation to environmental protection in their respective jurisdictions.

Our material purification process generates gaseous wastes, liquid wastes, waste water, noise and other industrial wastes in various stages of the manufacturing process. We have installed various types of anti-pollution equipment in our production facilities to reduce and treat the wastes generated in our manufacturing process. Our operations are subject to regulation and periodic monitoring by the State Environmental Protection Bureau of the PRC, as well as local environmental protection authorities. The PRC national and local environmental laws and regulations impose fees for the discharge of certain waste substances. If discharges exceed the prescribed levels, excess discharge fees are charged. The PRC national and local governments may at their own discretion assess fines, close or suspend the operation of any facility that fails to comply with orders requiring it to cease or remedy activities causing environmental damage. No such penalties have been imposed on us, and we believe that we have been in material compliance with applicable environmental regulations and standards.

We have obtained the land use permit and the water and soil preservation permit for the Dashuigou and Majiagou mines. We also received ISO 9001:2000 and GB/T19001-2000 certificates which are valid from January 9, 2008 until December 20, 2010. This Quality Management System applies in the areas of design, development and production of certain metals and high purity compounds.