

Mail Stop 4561

February 17, 2006

Matthew Foster
Ascent Solar Technologies, Inc.
8120 Shaffer Parkway
Littleton, CO 80127

**RE: Ascent Solar Technologies, Inc.
Registration Statement on Form SB-2
File No. 333-131216
Filed on January 23, 2006**

Dear Mr. Foster:

We have reviewed your filing and have the following comments. Where indicated, we think you should revise your document in response to these comments. If you disagree, we will consider your explanation as to why our comment is inapplicable or a revision is unnecessary. Please be as detailed as necessary in your explanation. In some of our comments, we may ask you to provide us with supplemental information so we may better understand your disclosure. After reviewing this information, we may or may not raise additional comments.

Please understand that the purpose of our review process is to assist you in your compliance with the applicable disclosure requirements and to enhance the overall disclosure in your filing. We look forward to working with you in these respects. We welcome any questions you may have about our comments or on any other aspect of our review. Feel free to call us at the telephone numbers listed at the end of this letter.

General

1. We note the references to proposed issuances of up to 290,909 units to your bridge lenders. Please advise us about the discussions undertaken with the bridge lenders regarding this issuance. When did the discussions commence, who were the participants, and how was the number of units to be issued determined? If we are correct in believing that you expect to issue these securities in reliance upon an exemption from registration, provide a factual and legal analysis explaining why you believe the exemption to be relied upon is available. Please address whether the offer and sale to the bridge lenders does not involve a public offering

- and analyze whether it is a separate offer from the offering to public investors. Are we correct in believing that the rights will automatically convert into restricted units issued at the public offering price under the terms of the investor subscription agreements, if the proposed registered public offering is completed before the maturity date of the notes sold to the bridge investors? Finally, clarify whether Exhibit 10.12 has been executed and file completed copies of the executed agreement(s) or explain when these agreements are to be entered into.
2. Disclosure indicates that you were “spun-off” from ITN Energy Systems, Inc. on October 18, 2005 yet we do not see disclosure that indicates that ITN Energy Systems made a distribution of Ascent’s shares to ITN’s shareholders, which is the ordinary meaning of the term “spin-off.” Was there such a distribution? If so, please provide appropriate Item 26 disclosure and provide an analysis that addresses the exemption from registration that ITN Energy Systems relied upon in connection with the “spin-off.” If the transaction was a separation of a business unit or division of ITN from the remainder of ITN’s business operations, please revise throughout to state this more clearly.
 3. Are there any conditions other than the lapse of time that must be satisfied before the common stock and warrants are permitted to trade separately? If so, please provide appropriate disclosure. Please explain the steps shareholders would take to receive the shares of common stock and warrant certificates that are components of the units. Will purchasers of units have voting rights, state law rights of inspection and other rights as holders of common stock during the 30 day period prior to the unbundling of the units?

Inside Front Cover and Outside Back Cover Pages of Prospectus

4. Please provide the disclosure required by Item 502 of Regulation S-B; Dealer Prospectus Delivery Obligation. Additionally, please move the text currently appearing after the table of contents to a part of the prospectus that is not subject to Rule 421(d).

Prospectus Summary, page 1

5. Please thoroughly revise your summary to provide a candid and concise description of the current status of your business, *i.e.*, what you have actually accomplished and what you must accomplish to pursue your business plan. State in the initial paragraph that you have not commercially produced any products or received any revenues from the proposed products that you seek to commercialize as your principal business activity. Provide a concise explanation of the status of your proposed product. Have you finalized the design of the proposed product or constructed prototypes of a proposed product? Is further design, development or testing of the product required? What steps in addition to the creation of a commercial manufacturing line must be accomplished before you will have a

product to sell? How do you intend to distribute the product, if one is developed and commercially produced? The text on pages 22-23 should also be significantly expanded to thoroughly discuss the status of the development, testing, production and marketing of the proposed lightweight, flexible photovoltaic products.

6. Please revise the text that states goals or objectives in terms that suggest those goals or objectives will be achieved. For example, it appears inappropriate to state that you “will manufacture PV devices” since it does not appear that you have manufactured such devices. Revise language of this nature throughout the filing so that plans or expectations are discussed in terms that make it clear to the investor that those uncertain future events may not occur.

This Offering, page 3

7. We note your offering of “units” consisting of one share of common stock, one redeemable Class A warrant and two non-redeemable Class B warrants. Tell us your intended accounting for these units including whether you intend to account for each element of the unit (common stock and warrants) separately upon the sale of the units. Tell us how you considered the conditions described in paragraphs 12-32 of EITF 00-19 in determining the classification of the warrants. We note on page 10 that if you do not maintain an effective registration statement, a holder may not be able to exercise the warrants. In this regard, specifically address how you meet the criteria in paragraphs 14 – 18 of EITF 00-19.
8. Please provide a similar analysis for the 300,000 representative warrants granted in connection with this offering.

Risk Factors, page 5

9. In the introductory paragraph, clarify that you disclose all “material” risks here.
10. Please review this section and, where appropriate, provide quantitative information to give investors appropriate context for the magnitude and significance of the various risks you describe. For example, what is the minimum amount of revenue you expect to realize from the performance of existing research and development contracts within the next 12 months, which you discuss on page 6? What is the dollar amount of the research contracts that were transferred to you remaining to be performed, and what is the dollar amount of the research and development contracts that may not be transferred to you that you reference on page 7? What is the minimum “substantial investment of capital” that you believe will be required to develop the commercial production line referenced on page 7?
11. Please provide a prominently positioned risk factor that alerts investors to the fact that the financial statements of the transferred assets of ITN Energy that are

included in the filing do not represent historical operations of the entity in which investors will be purchasing securities. In that paragraph, please clarify that the operating methods and business proposed to be conducted by ITN varies from the business that Ascent Solar plans to conduct and describe the impact this has on the usefulness of the financial statements. Provide appropriate guidance to investors in the use of these financial statements in evaluating Ascent and its proposed business.

“We expect significant sales in connection with Lockheed Martin’s . . . ,” page 5

12. Please provide the basis for your assumption that you will be the successful bidder for PV products used in connection with the prototype HAA project.

“We have no contracts for PV products and have recorded . . . ,” page 6

13. The disclosure contained in the last sentence represents a separate risk to investors that should be given individualized treatment.
14. In the carryover paragraph on page 9, you indicate that the warrants can be redeemed on short notice if the unit price exceeds 170% of the exercise price for five consecutive trading days. Are there any other conditions that must be satisfied for you to redeem part or all of a class of warrants, such as the existence of a current prospectus relating to the exercise of the warrants? If the warrants may be redeemed when the exercise of the warrants is not possible due to the lack of a current prospectus, please clarify this.

Use of Proceeds, page 12

15. To the extent practicable, please provide more specific disclosure regarding the allocation of the use of proceeds. For each enumerated use, add disclosure discussing the items that comprise each use. We specifically refer you to the Business Development and Sample Production and Research and Technology Development.
16. Disclose the portions of applicable offering proceeds use categories that will be paid to affiliates. For example, will a portion of the “general corporate purposes” will be paid to your majority shareholder under the sublease agreement, the service center agreement, and the administrative services agreement or to the company’s executive officers? Provide appropriate consideration as to whether a risk factor should be used to more prominently alert investors concerning the significant proportion of the offering proceeds that will be paid to affiliates of Ascent.

17. We note your statement that you “may find it necessary or advisable to use portions of the net proceeds . . . for other purposes” and that you will have “broad discretion in applying the net proceeds.” Be advised that you may change the use of proceeds provided such reservation is due to certain contingencies that are specifically discussed and the alternatives to such use are indicated. Refer to Instruction 7 to Item 504 of Regulation S-K for guidance. Please revise your disclosure accordingly.

18. For the repayment of bridge loans, revise your disclosure in accordance with Instruction 1 of Item 504 of Regulation S-B.

Capitalization, page 13

19. Please reconcile the information provided in your “pro forma as adjusted” capitalization table to the stockholders equity in the pro forma combined balance sheet on page F-3 plus the net proceeds to be received in this offering from the sale of 3,000,000 units.

Management’s Discussion and Analysis of Financial Condition, page 15

20. You should substantially expand your disclosure in this section to discuss the events, trends, risks, and uncertainties that management views as most critical to the company’s revenues, financial position, liquidity, plan of operations and results of operation. In an effort to assist you in this regard, we refer you to the Commission’s most recent MD&A interpretive guidance set forth in Release No. 33-8350 (December 29, 2003). This guidance is intended to elicit more meaningful disclosure in MD&A in a number of areas, including the overall presentation and focus of MD&A, with general emphasis on the discussion of known trends, demands, commitments, events and uncertainties, and specific guidance on disclosures about liquidity, capital resources and critical accounting estimates. For example, your introductory disclosure in this section should discuss key challenges and risks on which you are focused in both the short and long term as well as the steps you are taking to address them. Your discussion should highlight the most important matters on which you are focusing in evaluating your specific financial condition and operating performance. In this regard, the company’s plans for the production facilities should be significantly expanded to include a discussion of the projected timeframes and cost associated with each specific milestone relating to the construction and completion of the production facility.

21. In addressing the preceding comment, please ensure that you discuss the research contracts that have been and may be assigned to you by ITN Energy. Discuss the financial commitments associated with the assumption of those contracts and indicate the nature and amount of the services to be rendered. Discuss the revenues to be received under the ongoing contracts in quantitative terms and

compare the future period revenues to be received under the contracts with the revenues realized in the financial statements included in the filing. The dollar effect of your decision to shift your business focus away from r&d contracting to energy cell manufacturing and sales is a known trend that should be discussed in quantitative terms.

Liquidity and Capital Resources, page 18

22. Revise the liquidity and capital resources section to state clearly whether your current and available capital resources, are sufficient to fund planned operations for a period of not less than twelve months from the date of the prospectus. State whether the offering proceeds will enable you to fund planned operations for the 12-month period? If a deficiency will remain following the receipt of the offering proceeds, state the estimated deficiency in dollar terms and discuss how you plan to address the deficiency. In discussing your expected liquidity needs, please revise to specifically the rate at which you are currently using funds in your operations, with the expected rate at which capital is to be used in operations over the 12 month period. In preparing this disclosure, consider explain how your need to discharge current liabilities within the twelve months will impact the rate at which you use funds in operations and your need for capital.
23. Please revise your discussion to focus on the primary drivers of and other material factors necessary to understand your company's cash flows. In addition, discuss all known trends, events or uncertainties, which are reasonably likely to impact future liquidity, as necessary. We refer you to Section IV of SEC Release No. 33-8350.

Proposed Business, page 19

24. Please specifically disclose the factual basis for and the context of all your beliefs, understandings, estimates, and opinions. This particularly pertains to your disclosure of all projections, statistics, and assertions. Unless you can substantiate on a reasonable basis all of the projections, statistics and assertions that you cite, please remove them. To the extent you rely on industry analyses, please disclose whether the source is publicly available. If the source is not available for no or nominal charge, then the company must adopt the information as the company's own or provide a consent for its use. Also, supplementally provide the staff with copies of all sources utilized for your disclosure of statistics. Some examples include the following. This is not an exhaustive list.
 - The statements regarding the matters that "plague other PV device manufacturers" on page 19
 - The majority of the disclosure in the first and third paragraphs of the "Space Applications: Satellites and Spacecraft" subsection on page 19;
 - The disclosure contained in the second sentence of the "Ascent's

- Technical Advantages Over Competitors” subsection on page 22;
- The claim that ITN was “the first company to master the use of roll-to-roll production of thin-film CIGS PV modules on page 23 as well as a description of what ITN has accomplished in that respect.
25. References to the \$3.9 million domestic and \$10.2 billion worldwide market for satellite manufacturing on page 20 do not appear to be appropriate, since you propose to provide only one component of satellite systems. Your references to potential markets should be limited to the markets that you proposed products are expected to address. Please revise accordingly.
26. Please expand page 21 to explain the nature of the proposal you made to Lockheed. Have you provided prototypes of your proposed product to Lockheed for testing or evaluation? Clarify whether the proposal was in writing and if so, please provide a copy supplementally. Was the proposal in response to a Lockheed request to potential suppliers? Please explain the status of the proposal.

Intellectual Property, page 25

27. Please expand your disclosure pursuant to Item 101(b)(7) of Regulation S-B. This disclosure should include a complete description of your patents and licenses. You should provide a meaningful discussion of the nature of each piece of intellectual property and how you intend to utilize each component of the intellectual property. In this respect, we note the risk factor on page 7 that indicates that ITN Energy may not be able to transfer some technologies that you apparently intend to use in the development and proposed commercialization of your proposed products. Please expand to clarify these matters.
28. Expand the disclosure relating to the non-exclusive licenses with the University of Delaware’s Institute of Energy Conversion and with NREL for U.S. patents.

Management, page 26

29. Please discuss the role and function of the technical advisory board and the duties and functions of members of the entity. What responsibilities have been assigned to this entity and what portion of the time of the members of the board will be devoted to the business and affairs of Ascent? How do the activities and responsibilities of members of the technical advisory board relate to the activities and duties of members of the board of directors concerning technical matters? Disclose what the members of the advisory board have agreed to do for Ascent and discuss the extent to which business opportunities or other technologies which the members of the technical advisory board encounter or develop must be offered to or will be the property of Ascent.

30. You indicate that your treasurer and controller will continue to serve as controller and business manager of ITN Energy. Disclose the minimum portion of the working time of Ms. Casteel that will be devoted to the business of Aspect Solar.
31. We note that Mohan S. Misra, Ph.D. and Ashutosh Misra are directors. Please indicate whether there is a "family relationship" between the directors within the meaning of paragraph (c) of Item 401 to Regulation S-B and, if so, please describe the relationship.

Related Party Transactions, page 35

32. Your Item 404 disclosure lacks any meaningful discussion of the related party agreements maintained with ITN Energy Systems. Please provide a reasonably detailed description of the material terms, financial and otherwise, of the Sublease, Service Center, Manufacturing Line, Administrative Services Agreements that you maintain with ITN Energy Systems filed as Exhibits 10.5, 10.6, 10.7, and 10.8, respectively. Unless the amount of the transaction does not exceed \$60,000, you must disclose the nature of and amount of ITN's interest in the transaction(s). For example, with respect to the Sublease Agreement, specifically reference the \$701,000 of rental payment that Ascent has agreed to pay ITN under the sublease. Also give a detailed breakdown of the monthly rental rates to be charged from one year to the next as well as other obligations imposed on Ascent by entry into the sublease, such as the obligation to fund a portion of the insurance on the property. As for the Service Center Agreement, we note that Provision 3 merely indicates that, for use of the equipment, AST agrees to pay ITN in accordance with ITN's standard service center charges ITN charges other customers. Please give quantitative meaning to the amount of ITN's standard service center charges and provide the basis or such charges being deemed "standard." Similarly, the Manufacturing Line Agreement merely provides that ITN shall be paid its cost plus a fee for the work performed and that in calculating such cost plus a fee, the parties agree to use the then current provisional rates proposed by ITN and approved by the Defense Contract Audit Agency. Please quantify the aggregate costs and fees associated with the manufacturing line, including the \$200,000 for phase 1 which will be conducted within six months. Similar disclosure should be provided for the Administrative Services Agreement.

Ascent Solar Technologies, Inc. Financial Statements

Unaudited Pro Forma Combined Statement of Operations, page F-4

33. We note your pro forma combined statements of operations for the ten months ended October 31, 2005 and for the year ended December 31, 2004 on pages F-4 and F-5, respectively, do not provide pro forma earnings per share data. Tell us

how you considered including such information on the face of the pro forma statement of operations.

34. We also note in your pro forma combined statement of operations for the year ended December 31, 2004 that you include a pro forma adjustment for the issuance of 972,000 shares of common stock to the founders with an intrinsic value of \$0.96 per share. Tell us why you believe this adjustment is appropriate in your pro forma statement of operations. In this regard, it appears this adjustment is a nonrecurring charge that will only be included in your statement of operations within the 12 months following the transaction and as a result, should not be included in your pro forma statement of operations. Note that if you believe this adjustment is necessary to an understanding of the Company's operations then disclose this information in a note to the pro forma financial statements, which clearly indicates that it was not included in the pro forma statement of operations.
35. We note your pro forma adjustment (D) for \$720,000 to reflect the value of the bridge rights in connection with the Bridge Loan financing. Tell us how you determined the value of the bridge rights, including any assumptions used. Tell us why you believe this adjustment is appropriate in your pro forma statement of operations. In this regard, it appears this adjustment is a nonrecurring charge that will only be included in your statement of operations within the 12 months following the transaction and as a result, should not be included in your pro forma statement of operations. Note that if you believe this adjustment is necessary to an understanding of the Company's operations then disclose this information in a note to the pro forma financial statements, which clearly indicates that it was not included in the pro forma statement of operations.

Note 4. Subsequent Events

Stock Option Plan, page F-11

36. Provide the following information in chronological order for options granted preceding the most recent balance sheet date and through the date of your response:
- The date of grant;
 - The name of the grantee and the grantee's relationship to the Company;
 - The reason for the grant;
 - The number of options granted;
 - The exercise price;
 - The deemed fair value of underlying shares of common stock;
 - The total amount of compensation expense related to the grant and the magnitude and timing of expense recognition.

- Continue to provide us with updates to the requested information for all equity related transactions subsequent to this request through the effective date of the registration statement.
37. Provide us with objective evidence that supports your determination of the fair value of the underlying shares of common stock at each grant. Tell us what consideration you gave to the accounting and disclosure provisions of the AICPA Practice Aid “Valuation of Privately-Held-Company Equity Securities Issued as Compensation” (the “Practice Aid”). This objective evidence could be based on valuation reports that rely on methodologies discussed in the Practice Aid or on current cash sales of the same or a similar company security to a willing unrelated party other than under terms and conditions arising from a previous transaction. Where you have obtained a third-party valuation, tell us what level of assurance the appraiser gave in the fair value assessment. Describe significant intervening events within the Company that explains the changes in fair value of your common stock up to the filing of the registration statement. Reconcile and explain the differences between the mid-point of your estimated offering price range and the fair values asserted in your analysis.
38. We also note that in November 2005, the Company issued 972,000 shares of common stock at a price of \$0.04 per share but recorded such stock at an estimated market value of \$1.00. Provide a similar analysis as requested in the Staff’s previous comment to support the estimated market value used in your accounting for such issuance.

Bridge Financing and Short-Term Loan, page F-11

39. We note you issued a bridge loan in January 2006 with bridge rights. Tell us how you are accounting for the bridge loan including the bridge rights. In this regard, we note that the bridge loan is convertible into shares of the Company’s common stock at a price of \$3.00 per share if a qualified public offering is not completed by January 2007. Tell us whether you believe a contingent beneficial conversion feature exists and how you considered the guidance provided in EITF 98-5 and EITF 00-27.

ITN Energy Systems, Inc. Financial Statements

Statements of Revenues and Expenses, page F-15

40. We note on that your statement of revenues and expenses for the ten months ended October 31, 2004 and 2005 are not identified as “unaudited”. Confirm whether these periods were audited or identify these statements as unaudited.

Note 1. Organization and Basis of Presentation, page F-18

41. We note that certain corporate overhead costs were allocated to the financial statements based on what management believes to be reasonable estimates. Revise to include a discussion of the allocation method used (i.e. incremental or proportional cost allocation) pursuant to Question 2 of SAB Topic 1.B.

Part II – Information Not Required in Prospectus

Undertakings

42. The undertakings required in connection with an offering subject to Rule 415 have recently been amended. Please provide all required undertakings set forth in Item 512(a) of Regulation S-B.

Closing Comments

As appropriate, please amend your registration statement in response to these comments. You may wish to provide us with marked copies of the amendment to expedite our review. Please furnish a cover letter with your amendment that keys your responses to our comments and provides any requested supplemental information. Detailed cover letters greatly facilitate our review. Please understand that we may have additional comments after reviewing your amendment and responses to our comments.

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filings reviewed by the staff to be certain that they have provided all information investors require for an informed decision. Since the company and its management are in possession of all facts relating to a company's disclosure, they are responsible for the accuracy and adequacy of the disclosures they have made.

Notwithstanding our comments, in the event the company requests acceleration of the effective date of the pending registration statement, it should furnish a letter, at the time of such request, acknowledging that:

- should the Commission or the staff, acting pursuant to delegated authority, declare the filing effective, it does not foreclose the Commission from taking any action with respect to the filing;
- the action of the Commission or the staff, acting pursuant to delegated authority, in declaring the filing effective, does not relieve the company from its full responsibility for the adequacy and accuracy of the disclosure in the filing; and

- the company may not assert staff comments and the declaration of effectiveness as a defense in any proceeding initiated by the Commission or any person under the federal securities laws of the United States.

In addition, please be advised that the Division of Enforcement has access to all information you provide to the staff of the Division of Corporation Finance in connection with our review of your filing or in response to our comments on your filing.

We will consider a written request for acceleration of the effective date of the registration statement as a confirmation of the fact that those requesting acceleration are aware of their respective responsibilities under the Securities Act of 1933 and the Securities Exchange Act of 1934 as they relate to the proposed public offering of the securities specified in the above registration statement. We will act on the request and, pursuant to delegated authority, grant acceleration of the effective date.

We direct your attention to Rules 460 and 461 regarding requesting acceleration of a registration statement. Prior to the effectiveness of the company's registration statement, please inform us as to whether or not the amount of compensation allowable or payable to the Underwriters has received clearance by the NASD. Please allow adequate time after the filing of any amendment for further review before submitting a request for acceleration. Please provide this request at least two business days in advance of the requested effective date.

You may contact at Patrick Gilmore at (202) 551-3406 if you have questions regarding comments on the financial statements and related matters. Questions on other disclosure issues may be directed to Jay Ingram at (202) 551-3397. If you require further assistance, please contact me at (202) 551-3462, or the Assistant Director, Barbara C. Jacobs at (202) 551-3735.

Sincerely,

Mark P. Shuman
Branch Chief

cc. Mark A. von Bergen *via telecopier*
(503) 241-8014