

Mail Stop 4561

May 19, 2006

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

**RE: Ascent Solar Technologies, Inc.
Registration Statement on Form SB-2/A
File No. 333-131216
Amendment Filed on April 20, 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.

General

1. Please confirm that you will provide restricted securities to the holders of the Bridge Rights upon exercise/conversion of those rights. Also confirm our understanding that the registration statement will not be used for resales of the securities underlying the rights and that resales of the shares underlying the Bridge Rights, if any, will occur pursuant to a new registration statement filed after the completion of the public offering of the rights or pursuant to Rule 144.
2. We note that the subscription agreement requires that you “concurrently” register the resale of the securities underlying the rights with the securities registered in the IPO. Refer to page 3 of the subscription agreement. Will you attempt to comply with this provision? If not, describe for us the consequences of such noncompliance.
3. With respect to the discussion of the warrants in the summary, risk factors section, and pages 45-46, we note the absence of disclosure indicating that there “may be circumstances in which the company will never opt to settle the warrants, whether in shares or payment of cash”, as stated on page 17 of your response

letter. Please explain those circumstances and describe the potential adverse effects on purchasers of the warrants.

4. Please update your financial information contained in your registration statement pursuant to Item 310 of Regulation S-B as necessary.

Prospectus Summary, page 1

5. We note the disclosure contained in the last risk factor. Please add disclosure to the summary that appropriately addresses the risks highlighted in the disclosure on page 12. Also revise the relevant disclosure to state concisely that the warrant might not be exercisable when it is in-the-money and that might never be exercisable.

Risk Factors, page 5

6. We cannot locate your revisions in response to our prior comment 12 of our letter of March 31, 2006. It appears the risk factor has been deleted. Please address our prior comment 12, or more specifically explain where and how you have addressed that comment.

Capitalization, page 15

7. Please provide both the number of outstanding shares at the historical balance sheet date and as of the date of the completion of the offering.

Management's Discussion and Analysis of Financial Condition and Results of Operations, page 17

8. Please expand the third paragraph on page 19 to describe the "other technical and strategic advantages" that you hold over your competitors. With a view toward disclosure the prospectus, in the response letter describe the reasonable basis of your beliefs with respect to each competitive advantage you claim.

Critical Accounting Policies, page 21

Stock Based Compensation, page 21

9. Please refer to our prior comment 17 of our letter dated March 31, 2006. We have reviewed your revisions on page 22 and note that you used the \$3.00 conversion price of your bridge loan issued on January 18, 2006 as the fair value of your common stock on that date. Pursuant to paragraph 58 of the AICPA Practice Aid "Valuation of Privately-Held-Company Equity Securities Issued as Compensation", if transactions are used as a basis for valuing an enterprise, certain characteristics of those transactions may require special consideration.

Considering the Bridge Loan is not a direct transaction in the Company's equity, but rather allows for conversion into the Company's common stock, it is not clear how you determined that the conversion price was representative of the implied fair value of the Company's common stock. Please explain. Also, it is not clear how you determined that the \$3.00 per share conversion price did not include a beneficial conversion feature. In this regard, tell us how you determined that the 10% interest rate on the notes was representative of the market rate of interest for a development stage company. We may have further comments based on your response.

10. Notwithstanding your response to our previous comment, we note in your disclosure that in determining the fair value of common stock on November 18, 2005, a discount from the \$3.00 per share fair value to \$2.00 per share was considered appropriate. The Company supported this discount by the estimated public offering price of \$5.50 per unit as each unit includes three warrants in addition to one share of common stock. However, based on the terms of the warrants included in each unit, as described in your response to comment 1 of our letter dated April 13, 2006, you have complete control over settlement of the warrants and as a result, it does not appear that significant value would be placed on such warrants. Please explain.
11. Revise your disclosures to discuss the reasons for the significant increases in the fair value of your common stock at each of the following dates: November 3, 2005 (\$1.00 per share), November 18, 2006 (\$2.00 per share) and January 18, 2006 (\$3.00 per share), similar to the internal memo provided in the previous response letter dated March 10, 2006.

Proposed Business, page 26

12. Expand the second paragraph on page 28 to describe the nature of the support provided by Dow Corning Corporation with respect to the joint proposal of Ascent Solar and ITN to Lockheed Martin. In your response letter, tell us whether Dow Corning Corporation is aware of and concurs with the descriptions of this support that are provided in the revised prospectus.
13. Your response to our prior comment 19 of our letter dated March 31, 2006 references that you have not finalized the license with IEC. Prior to effectiveness, please advise us regarding the status of the license agreement with IEC. If there is uncertainty as to whether the license agreement will be obtained, then disclosure to the effect that the company does not possess technology that it needs and the consequences thereof might be warranted.

Management, page 35

14. We note that the year end option value disclosed in the table on page 40 is computed based on a share price of \$2.00. Please explain why you do not intend to value the registrant's stock at the initial public offering price. See Telephone Interpretation J.17 of the 1999 Corp. Finance Current Issues Outline and Release No. 34-32723 at I.V.

Principal Stockholders, page 42

15. Consider revising the reference to "majority" ownership on page 43 and elsewhere to clarify that Dr. Misra and an immediate family member own all of the shares of Inica.

Related Party Transactions, page 43

16. Please expand the second paragraph to explain the basis upon which the technology and shares exchanged in the license agreement were valued by the parties. On what basis was the number of shares selected? Also, expand to explain the reasonable basis for Ascent's belief that the terms of these transactions were "no less favorable to us than could be obtained from independent parties". On what basis do you believe that the acquisition of unique technology rights from a controlling shareholder is comparable to terms of a transaction that could be available from a non-affiliate?
17. Please expand the discussion of the sublease agreement to compare the sublease terms with the terms of the primary lease of the facility of ITN. Is ITN leasing this space at its cost, and if not, what is the disparity between ITN's leasehold expenses for the subleased space and the amounts it will receive from Ascent Solar? We note that some of the expenses are paid by Ascent Solar on a pass-through basis.

Description of Securities, page 45

Class A Warrants, page 45

18. Please disclose the basis upon which you excluded the price that must be reached to trigger the redemption right of Ascent Solar with respect to the Class A warrants. At a minimum, you should explain the formula upon which the price that will trigger redemption will be set. Also, on what basis do you exclude the exercise prices of the warrants? Provide appropriate disclosure of how the warrant exercise prices will be established. Will these prices bear a relationship to the unit offering price that can be described in percentage or similar terms? See Item 505(b) of Regulation S-B for guidance.

19. The last sentence of page 46 refers to a right of the issuer to redeem the Class B warrants. The next paragraph, however, states that the Class B warrants are non-redeemable. Please reconcile.

Unaudited Pro Forma Financial Statements

20. Please refer to our prior comment 26 of our letter dated March 31, 2006. We have reviewed your revisions in your registration statement and note that you have included the bridge loan transaction as an adjustment to the pro forma balance sheet but have not included the corresponding interest expense as a result of the amortization of the debt issuance costs or the 10% interest rate as an adjustment in the pro forma statement of operations. If this bridge loan is (a) directly attributable to the transaction (b) factually supportable and (c) expected to have a continuing impact, revise your pro forma statement of operations to include such adjustments.
21. We also note in your response to comment 28 of our letter dated March 31, 2006 that bridge loan is reflected net of the \$160,000 paid to the placement agent. Tell us what accounting literature you are relying on in recording these issuance costs as a discount on the bridge loan as opposed to a deferred charge classified as an asset on the balance sheet or revise accordingly.

* * * *

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.

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

Matthew Foster
Ascent Solar Technologies, Inc.
May 19, 2006
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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