

May 23, 2007

Mail Stop 6010

Daniel F. Lyman
General Counsel
GT Solar International, Inc.
243 Daniel Webster Highway
Merrimack, New Hampshire 03054

**Re: GT Solar International, Inc.
Registration Statement on Form S-1
Filed April 26, 2007
File No. 333-142383**

Dear Mr. Lyman:

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 information so we may better understand your disclosure. After reviewing this information, we may 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 any other aspect of our review. Feel free to call us at the telephone numbers listed at the end of this letter.

Prospectus Cover Page

1. Please confirm that any preliminary prospectus you circulate will include all non-Rule 430A information. This includes the price range and related information based on a *bona fide* estimate of the public offering price within that range.

Prospectus Summary

2. The introductory paragraph to your summary states that the summary is not complete. A summary, by its very nature, does not and is not required to contain all of the detailed information that is in the prospectus. However, if you have elected to include a summary in your prospectus, it must be complete. Do you mean to say that, because this is a summary, it may not contain all of the information that is important to your investors? Delete the reference to an incomplete summary from your prospectus.

3. We note your first five paragraphs in this section are identical to the business section. Please revise to avoid repeating disclosure.
4. If your products do not perform key steps in the solar wafer and module products process, please clarify and describe the reliance on third-party equipment to provide turnkey manufacturing with the same prominence as your references to turnkey manufacturing.
5. Please provide us independent, objective support for the statements regarding your leadership and market standing. For example, you indicate in the summary and in other parts of your prospectus that you are “one of the world’s largest providers of manufacturing equipment and ‘turnkey’ manufacturing solutions” and you “have established a leading position in the market” and your DSS units accounted for “over 80% of the equipment purchased from third parties for this application in 2006.”
6. The disclosure in the summary should be a balanced presentation of your business. For example
 - if you elect to highlight the percentage of third-party equipment purchases that you contribute, balance the disclosure with equally prominent disclosure of your reliance on a small number of customers.
 - if you elect to highlight your revenues, balance the disclosure with equally prominent disclosure regarding your losses.
 - if you elect to highlight your strengths, balance the disclosure with equally prominent disclosure of your challenges.
 - if a discussion of your polysilicon reactors is appropriate for your summary, balance the disclosure with equally prominent disclosure of your statement on page 16 that you have not yet recognized any revenue from the sale of polysilicon reactors or converters.
7. We note the disclosure regarding your backlog on page 1. Please avoid unnecessary duplication with other disclosure in your summary like on page 2. Also, with a view toward clarifying the disclosure, please tell us:
 - the extent to which the backlog is cancellable;
 - the length of time it will take to recognize the disclosed backlog as revenue;
 - the extent to which contracts in your backlog provide margins comparable to your recent margins reported in this prospectus; and
 - why you believe it is appropriate to highlight your backlog in the summary out of the context that you provide in the risk factors on page 11 and 17.

Market Opportunity, page 2

8. We note you have selected to reference “one of three forecast scenarios.” Please tell us why you have selected the one you decided to disclose and how it differed from the other two scenarios.
9. Please furnish marked copies of studies that support the statistics cited, and tell us whether all industry data you cite in your document is publicly available. Also tell us:
 - how you confirmed that the data reflects the most recent available information,
 - whether you paid for the compilation of the data, and
 - whether the authors of the data consented to your use of it in the registration statement.

If you were affiliated with the preparation of the data, please ensure that your disclosure clearly indicates the nature of all such affiliations.

Corporate Information, page 4

10. With a view toward clarified disclosure, please tell us whether the January 1, 2006 acquisition of “[y]our business” was GT Solar Holdings LLC’s acquisition of GT Solar Incorporated.

Risk Factors, page 9

11. We note your statements that the risks described “are not the only ones facing us” and “[a]dditional risks and uncertainties that we are aware of, or that we currently deem immaterial, also may become important factors that affect us.” Please revise to disclose all material risks.

Amounts included in our order backlog..., page 11

12. Please expand to detail the impact when you “have experienced variances in the realization of customer contracts and backlog.” Also, describe the nature of such variances.

Industry and Market Data, page 28

13. We note your statement regarding this data that you “cannot assure prospective investors as to their accuracy.” You should not include information in your prospectus that you do not believe is accurate. Likewise, you may not disclaim responsibility for your disclosure; the first sentence of the second paragraph implies that you have only limited responsibility for the data. Please revise accordingly.

Use of Proceeds, page 29

14. Please clarify the extent to which the selling shareholders are related to you, and disclose who will pay the expenses of the offering.

Capitalization, page 30

15. Please revise to remove the caption “cash and cash equivalents” from the capitalization table.

Unaudited Pro Forma Financial Statements, page 32

16. You may not disclaim responsibility for your disclosure. Please revise your statement in the third paragraph that this “financial data is for informational purposes only” which is an inappropriate disclaimer.

Management’s Discussion and Analysis of Financial Condition and Results of Operations, page 37

Fiscal Year Ended March 31, 2006 (On a Combined Basis) Compared to Fiscal Year Ended March 31, 2005

17. Please supplement the discussion of the combined results of operations for the fiscal year ended March 31, 2006 with separate discussions of the US GAAP results of operations for the predecessor and successor in periods in that year. Refer to Item 303 of Regulation S-K.

Revenue, page 46

18. Please discuss the reasons for the decrease in sales of tabber/stringer machines. Have the machines reached the end of their lifecycle? Have competitors introduced superior products?
19. We note your disclosure on the top of page 47 that the increase in revenues for the nine months ended December 31, 2006 was due to an “increase in revenue from turnkey solutions.” Yet, in the next paragraph you describe revenues decreasing from turnkey solutions. Please reconcile.

Cost of Revenue, page 47

20. Regarding your obligation to provide polysilicon to a customer, please clarify when the obligation ends and whether the customer can increase the amount of the product that it requires from you under the contract.

Backlog, page 67

21. Please tell us that the number of contracts that underlie the backlog. Also demonstrate whether your business is substantially dependent on any of the contracts. See Regulation S-K Item 601(b)(10)(ii)(B).

Intellectual Property, page 76

22. Please file material licenses as exhibits to your registration statement.

Competition, page 77

23. We note your disclosures on pages 65 and 77 that you license your intellectual property to others. With a view toward clarifying disclosure, please tell us the effect of these licenses on your competitive position.

Executive Compensation, Page 84

24. Please replace vague disclosure with meaningful information that investors can use to evaluate the compensation program. For example, where you refer to “competitive” compensation, “competitive companies,” “similarly situated executives” and the “market” or “marketplace,” please disclose with specificity how you define those terms. Likewise, please disclose the factors and comparable companies that the compensation consultant used in setting amounts, for example disclose the “input” you describe on the top of page 86, and how the 2008 bonus adjustments were “supported” on the top of page 87.
25. We note your disclosure about how annual salaries are set, taking into account prior experience, time in the industry, years of service and individual duties and responsibilities. Please describe more specifically the items of performance used in determining such amounts. Also show how those factors led to different decisions regarding adjustment of officers’ base salary for 2008.

Annual Cash Bonus Incentive, page 86

26. We note that you have not provided a quantitative discussion of the necessary EBITDA targets, or Mr. Keck’s commission targets, to be achieved in order for your executive officers to earn their discretionary annual bonuses. Provide such disclosure of the targets and commissions or alternatively tell us why you believe that disclosure of such information would result in competitive harm such that the information could be excluded under Instruction 4 to Item 402(b). To the extent that that it is appropriate to omit specific targets, discuss how difficult it will be for the executive or how likely it will be for the registrant to achieve the target levels or other factors. Also, please tell us how you set the percentages of base salary to be paid on achieving the EBITDA targets.

27. Please update the status of the bonuses that you indicate will be finalized in May 2007.
28. Please clarify what you mean by “a straight line interpolation between \$0 and the target cash bonus.”
29. Please describe the reasons for Mr. Zarella’s \$50,000 discretionary bonus, including what operating performance was being recognized and how such amount was determined. Also discuss the reasons for Mr. Ford's signing bonus and how the size of the bonus was determined.

Long-Term Incentive Awards, page 87

30. Please explain how you determined the amounts of stock options to be granted to your executive officers. Please describe the elements of individual performance and contribution that are taken into account in granting these options. Your revised disclosure also should clarify the reasons for the relative size of the grants among the officers.
31. Please describe how the equity ownership amounts for Mr. Zarrella and Mr. Smith were determined and how much they contributed for these shares.
32. Please include a discussion on how the terms and amounts of Mr. Gupta’s severance agreement were determined.

Summary Compensation Table, page 90

33. Please discuss the reasons for the differences between the salaries reported in the summary compensation table and the salaries mentioned in both the "Fiscal 2007" column of the first table on page 86 and in your subsequent disclosure regarding the employment agreements.

Kedar P. Gupta, page 94

34. Please clarify the extent to which the agreement permits Dr. Gupta to compete with you. Avoid disclosure that may not be understood by investors who do not work in your industry, like “reflectometers.”

Director Compensation, page 95

35. We note your table describes payments of cash and options to Mr. Godshalk, yet your disclosure does not describe any fee structure for directors currently. Please disclose the terms of the compensation arrangements with him.
36. Please describe how you will determine the payments to be made to your directors. For example what comparable companies will you use?

Certain Relationships and Related Transactions, page 99

37. Please expand your discussion of your transactions to describe the January 1, 2006 merger and the related parties' involvement. Also, please describe the September 28, 2006 reorganization merger and the merger transaction to occur prior to the offering.
38. Please disclose the guarantees given by GFI for your letters of credit and file them as exhibits. We note your disclosure in the middle of page 57.

Senior Secured Promissory Note, page 99

39. Please clarify why you issued the replacement note. Also, if the issuer of the \$15 million note issued in connection with the January 2006 acquisition of GT Solar Holdings LLC was a related party, please identify the issuer and disclose the terms of the original note and all benefits that the related parties received by replacing that original note.
40. Please clarify the relationship among the "GT Solar" entities and related parties. Use a diagram if appropriate.

Transactions with Related Companies, page 99

41. Please describe the operations of GT Global LLC and describe the equipment and parts sold to them. Also disclose whether your sales to the related party were at market prices.
42. We note the write-off of the amounts due from SC Fluids, Inc. Please also disclose the write-off of the convertible promissory note investment described at the bottom of page F-14.
43. We note your reference to your CFO being a "greater than 10% owner" of your consultant. With a view toward clarified disclosure, please tell us the percent of the consultant that the CFO owns. Also, disclose the nature of the consulting services provided; from your revised disclosure, investors should be able to understand why the services were not the type of services that would normally be provided by the CFO and why the consulting fees should not be considered compensation to the CFO.

Statement of Policy, page 100

44. Please expand this section to disclose the standards to be applied pursuant to the policies and procedures. See Regulation S-K Item 404(b)(1)(ii). Also, clarify how the disclosure under the "Corporate Opportunities" heading on page 104 is consistent with these policies, procedures and standards.

Tax Considerations, page 110

45. You may not disclaim responsibility for your disclosure. Please remove the statement that the disclosure is “for general information only” here and on page 113.

Description of Capital Stock, page 101

46. Your disclosure may not be qualified by reference to statutes. Please revise the first paragraph accordingly.

Corporate Opportunities, page 104

47. Please add appropriate risk factors to alert investors to the reduction of officers’ and directors’ duties to you and your shareholders. Also, if there is ambiguity in state law regarding whether such reduction is enforceable, please include appropriate disclosure.
48. Refer to the last paragraph of this section. With a view toward disclosure, please tell us why notice and consent to the provision is required. Also, please tell us how you determined that applicable law permits you to deem that shareholders have received the notice and provided the consent as you disclose.

Terminated Private Placement, page 105

49. Please disclose the size of the offerings mentioned in this section.

Underwriting, page 114

50. Refer to the last sentence of the fourth paragraph on page 114. Please reconcile the statement “after the initial public offering” with the statement that the “public offering price” may be changed.
51. Please expand the last paragraph on page 116 to provide more specific information regarding your relationships with the underwriters.

Financial Statements, page F-1

52. Please update the financial statements when required by Rule 3-12 of Regulation S-X.
53. Include updated accountants’ consents with amendments to the filing.

Report of Independent Registered Public Accounting Firm, page F-2

54. Please revise the second paragraph of the audit report to make reference to the auditing standards of the Public Company Accounting Oversight Board (United States).

Consolidated Statements of Operations, page F-4

55. Please revise the statements of operations to present expense for stock-based compensation in the same line or lines as cash compensation paid to the same employees in accordance with SAB Topic 14F. Similarly revise summary and selected financial data and the pro forma financial statements.

Note 2. Significant Accounting Policies, page F-8

Warranty, page F-11

56. We note your disclosure that you warrant all products for a period of one year. Please reconcile this with the disclosures on pages 16 and 75 disclosing warranty periods up to thirty months.

Revenue Recognition, page F-13

57. We note from page 18 that you typically recognize 90% of revenue for established products on shipment. We also see that you market turn-key solutions where you appear to be providing both products and services under a single arrangement. Please tell us and revise to address the terms of any multiple element arrangements as defined under EITF 00-21. Your discussion should address how the arrangement consideration is allocated among the separate units of accounting and the basis in GAAP for that allocation. Additionally, please tell us about the basis for your conclusion that three to five unit acceptances for new products is sufficient evidence to reclassify a product to an established product. Overall, clarify how your practices are appropriate under SAB 104.

Note 3. Business Combinations, page F-15

58. We note that you refer to an independent third party appraisal firm on page F-16 and a contemporaneous valuation used for stock compensation purposes on page 44. While you are not required to make reference to an independent valuation, when you do so, you must name the expert and file their written consent as an exhibit to the registration statement. See Item 601(b) of Regulation S-K.
59. We note that \$44.3 million of the purchase price was allocated to goodwill. Please explain the valuation methodology and significant assumptions used to allocate the purchase price to the acquired assets and liabilities, including goodwill. In addition, disclosure should also be provided of the factors that

contributed to the purchase price that resulted in the recognition of goodwill as required by paragraph 51.b. of SFAS 141.

Note 5. Stockholders' Equity, page F-35

60. Please provide us with a chronological bridge of management's fair value per share determinations to the current estimated IPO price per share. Also, indicate when discussions were initiated with your underwriter(s) about possible offering price ranges. We may have additional questions after the estimated IPO price is included in the filing.

Undertakings

61. Please note that due, in part, to the language of Securities Act Rule 430C(d), the undertakings included in Item 512(a)(5)(ii) and 512(a)(6) of Regulation S-K should be included in filings for initial public offerings. Please revise your filing to include these undertakings.

Exhibits

62. We note your reference to an application for confidential treatment. We will review and provide any comments related to your request separately. Comments must be resolved and your application must be complete before we may accelerate the effective date of your registration statement.

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 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 filing to be certain that the filing includes all information required under the Securities Act of 1933 and that they have provided all information investors require for an informed investment 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 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. 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 Lynn Dicker at (202) 551-3616 or in her absence, Gary Todd at (202) 551-3605 if you have questions regarding comments on the financial statements and related matters. Please contact Jay Mumford at (202) 551-3637 or me at (202) 551-3617 with any other questions.

Sincerely,

Russell Mancuso
Branch Chief

cc (via Fax): Damon R. Fisher

Daniel F. Lyman
GT Solar International, Inc.
May 23, 2007
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