



DIVISION OF  
CORPORATION FINANCE

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

January 27, 2012

Via E-Mail

Gary Gatchell  
Chief Financial Officer  
Ascent Solar Technologies, Inc.  
12300 North Grant Street  
Thornton, Colorado 80241

**Re: Ascent Solar Technologies, Inc.  
Amendment No. 1 to Registration Statement on Form S-3  
Filed January 26, 2012  
File No. 333-178821**

Dear Mr. Gatchell:

We have limited our review of your registration statement to those issues we have addressed in our comments. In some of our comments, we may ask you to provide us with information so we may better understand your disclosure.

Please respond to this letter by amending your registration statement and providing the requested information. Where you do not believe our comments apply to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing your amendment to your registration statement and the information you provide in response to these comments, we may have additional comments.

Prospectus Cover Page

1. We note your response to prior comment 1. Please tell us how you confirmed the accuracy of the statement that you have not sold any securities pursuant to General Instruction I.B.6 of Form S-3 in the last twelve months. We note, for example, your disclosure under Item 1.01 of the Form 8-K filed on January 5, 2012 regarding your entry into an agreement with Jones Trading Institutional Services LLC, as well as your statement under Item 1.02 of the Form 8-K that you sold 386,050 shares pursuant to a sales agreement entered into February 28, 2011 with Stifel, Nicolaus & Company.

Information Incorporation by Reference, page 9

2. Please revise to incorporate by reference the Form 8-K filed on January 5, 2012.

Gary Gatchell  
Ascent Solar Technologies, Inc.  
January 27, 2012  
Page 2

We urge all persons who are responsible for the accuracy and adequacy of the disclosure in the filing to be certain that the filing include the information the Securities Act of 1933 and all applicable Securities Act rules require. 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 you request acceleration of the effective date of the pending registration statement please provide a written statement from the company 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.

Please refer to Rules 460 and 461 regarding requests for acceleration. 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. Please allow adequate time for us to review any amendment prior to the requested effective date of the registration statement.

Please contact Mary Beth Breslin at (202) 551-3625 or me at (202) 551-3617 with any questions.

Sincerely,

/s/ Russell Mancuso

Russell Mancuso  
Branch Chief

cc (via e-mail): James Carroll (Faegre Baker Daniels LLP)