

As filed with the Securities and Exchange Commission on August 16, 2010
Registration No. 333-_____

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



FORM S-8

REGISTRATION STATEMENT UNDER THE
SECURITIES ACT OF 1933

CATERPILLAR INC.

(Exact Name of Registrant as Specified in Its Charter)

Delaware

(State of Incorporation)

37-0602744

(IRS Employer Identification No.)

100 NE Adams Street

Peoria, Illinois 61629

(Address of Principal Executive Offices)

Caterpillar 401(k) Plan

(Full Title of the Plan)

James B. Buda

Vice President, Secretary and Chief Legal Officer

Caterpillar Inc.

100 NE Adams Street

Peoria, IL 61629-7310

(309) 675-4429

(Name, Address and Telephone Number, Including Area Code, of Agent for Service)

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

☒

Accelerated filer

☐

Non-accelerated filer

☐

Smaller reporting company

☐

CALCULATION OF REGISTRATION FEE

Title of securities to be registered	Amount to be registered	Proposed maximum offering price per share	Proposed maximum aggregate offering price	Amount of registration fee
Common Stock, par value \$1.00 per share	55,000,000 shares ⁽¹⁾	\$67.39 ⁽²⁾	\$3,706,450,000	\$264,269.89
(1) Pursuant to Rule 416 under the Securities Act of 1933, as amended (the "Securities Act"), this Registration Statement also covers an indeterminate amount of additional securities that may be issued under the Plan pursuant to the anti-dilution provisions of the Plan.				
(2) Estimated solely for the purposes of calculating the registration fee, computed pursuant to Rules 457(c) and (h) under the Securities Act on the basis of the average of the high and low sales prices of a share of Caterpillar Inc. Common Stock, as reported on the New York Stock Exchange - Composite Transactions System on August 12, 2010.				

Part I

EXPLANATORY NOTE

This Registration Statement on Form S-8 is being filed to register an additional 55,000,000 shares of the Registrant's Common Stock, par value \$1.00 per share, to be issued pursuant to the Caterpillar 401(k) Plan, as amended (the "Plan"). In accordance with General Instruction E to Form S-8, the Registrant and the Plan hereby incorporate by reference the contents of the following Registration Statements previously filed by the Registrant and the Plan:

- Registration Statement on Form S-8 (Registration No. 333-111355) filed December 19, 2003, as amended by Post-Effective Amendment No. 1 to Form S-8 filed November 19, 2004; and
- Registration Statement on Form S-8 (Registration No. 333-133265) filed April 13, 2006.

Part II

INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

Item 8. Exhibits.

The following is a complete list of exhibits filed as a part of this Registration Statement:

<u>Exhibit No.</u>	<u>Description</u>
23.1	Consent of PricewaterhouseCoopers LLP

The Company will submit or has submitted the Plan and any amendment to the Plan to the Internal Revenue Service (the "IRS") in a timely manner and has made or will make all changes required by the IRS in order to qualify the Plan under Section 401 of the Internal Revenue Code of 1986, as amended.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the Registrant certifies that it has reasonable grounds to believe that it meets all the requirements for filing on Form S-8 and has duly caused this Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Peoria, and the State of Illinois.

CATERPILLAR INC.
(Registrant)

August 16, 2010

By: /s/James B. Buda
James B. Buda, *Secretary*

Pursuant to the requirements of the Securities Act of 1933, as amended, this Registration Statement has been signed by the following persons in the capacities and on the dates indicated.

August 16, 2010	<u>/s/James W. Owens</u> (James W. Owens)	Chairman of the Board and Director
August 16, 2010	<u>/s/Douglas R. Oberhelman</u> (Douglas R. Oberhelman)	Chief Executive Officer and Director
August 16, 2010	<u>/s/Richard P. Lavin</u> (Richard P. Lavin)	Group President
August 16, 2010	<u>/s/Stu L. Levenick</u> (Stu L. Levenick)	Group President
August 16, 2010	<u>/s/Edward J. Rapp</u> (Edward J. Rapp)	Group President and Chief Financial Officer
August 16, 2010	<u>/s/Gerard R. Vittecoq</u> (Gerard R. Vittecoq)	Group President
August 16, 2010	<u>/s/Steven H. Wunning</u> (Steven H. Wunning)	Group President
August 16, 2010	<u>/s/Jananne A. Copeland</u> (Jananne A. Copeland)	Controller and Chief Accounting Officer

August 16, 2010	<u>/s/W. Frank Blount</u> (W. Frank Blount)	Director
August 16, 2010	<u>/s/John R. Brazil</u> (John R. Brazil)	Director
August 16, 2010	<u>/s/Daniel M. Dickinson</u> (Daniel M. Dickinson)	Director
August 16, 2010	<u>/s/John T. Dillon</u> (John T. Dillon)	Director
August 16, 2010	<u>/s/Eugene V. Fife</u> (Eugene V. Fife)	Director
August 16, 2010	<u>/s/Gail D. Fosler</u> (Gail D. Fosler)	Director
August 16, 2010	<u>/s/Juan Gallardo</u> (Juan Gallardo)	Director
August 16, 2010	<u>/s/David R. Goode</u> (David R. Goode)	Director
August 16, 2010	<u>/s/Peter A. Magowan</u> (Peter A. Magowan)	Director
August 16, 2010	<u>/s/William A. Osborn</u> (William A. Osborn)	Director
August 16, 2010	<u>/s/Charles D. Powell</u> (Charles D. Powell)	Director
August 16, 2010	<u>/s/Edward B. Rust, Jr.</u> (Edward B. Rust, Jr.)	Director
August 16, 2010	<u>/s/Susan C. Schwab</u> (Susan C. Schwab)	Director
August 16, 2010	<u>/s/Joshua I. Smith</u> (Joshua I. Smith)	Director

Pursuant to the requirements of the Securities Act of 1933, as amended, the trustees (or other persons who administer the Plan) have duly caused this Registration Statement to be signed on its behalf by the undersigned, thereunto authorized, in the City of Peoria, the State of Illinois.

CATERPILLAR 401(k) PLAN

August 16, 2010

By: /s/Jonathan D. Ginzel
Name: Jonathan D. Ginzel
Title: Plan Administrator

Exhibit Index

<u>Exhibit No.</u>	<u>Description</u>
23.1	Consent of PricewaterhouseCoopers LLP

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statement on Form S-8 of our report dated February 19, 2010 relating to the financial statements and the effectiveness of internal control over financial reporting, which appears in Caterpillar Inc.'s Annual Report on Form 10-K for the year ended December 31, 2009.

/s/ PricewaterhouseCoopers LLP
PricewaterhouseCoopers LLP
Peoria, Illinois
August 16, 2010