

08-24-2001



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(Rev. 03/01)RECORDATION FORM COVER SHEET
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U.S. Patent and Trademark Office

OMB No. 0651-0027 (exp. 5/31/2002)

Tab settings ⇨ ⇨ ⇨ ▼ ▼ ▼ ▼ ▼ ▼

To the Honorable Commissioner of Patents and Trademarks: Please record the attached original documents or copy thereof.

1. Name of conveying party(ies):

Future Energy Resources Corp.

2. Name and address of receiving party(ies)

Name: Turner Foundation, Inc.

as Collateral Agent

Internal Address: _____

Additional name(s) of conveying party(ies) attached? ☐ Yes ☒ No

3. Nature of conveyance:



Assignment



Merger



Security Agreement



Change of Name



Other _____

Street Address: One CNN Center1090 South Tower, 11th FloorCity: Atlanta State: GA Zip: 30303Execution Date: August 21, 2001Additional name(s) & address(es) attached? ☐ Yes ☒ No

4. Application number(s) or patent number(s):

If this document is being filed together with a new application, the execution date of the application is: _____

A. Patent Application No.(s)

B. Patent No.(s)

4,828,581 and 5,494,653

Additional numbers attached? ☐ Yes ☒ No

5. Name and address of party to whom correspondence concerning document should be mailed:

Name: Susan LakeInternal Address: King & SpaldingStreet Address: 191 Peachtree StreetCity: Atlanta State: GA Zip: 303036. Total number of applications and patents involved: 27. Total fee (37 CFR 3.41).....\$ 80.00expedite \$ 120.00

Enclosed



Authorized to be charged to deposit account

8. Deposit account number:

(Attach duplicate copy of this page if paying by deposit account)

DO NOT USE THIS SPACE

9. Statement and signature.

*To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document.*Susan Lake

Name of Person Signing

Susan Lake

Signature

August 23, 2001

Date

08/27/2001 DBYRNE

00000073 4828581

80.00
120.00 DPTotal number of pages including cover sheet, attachments, and documents: 10
Documents to be recorded with required cover sheet information to:
Commissioner of Patents & Trademarks, Box Assignments
Washington, D.C. 2023101 FC:581
02 FC:584PATENT
REEL: 011898 FRAME: 0036

SCHEDULE I
to Amended and Restated Collateral Assignment
and Security Agreement (Patents)

COUNTRY	PATENT #	EXPIRATION DATE
BIOMASS GASIFICATION SYSTEM AND METHOD		
United States		Pending -12/21/2020
LOW INLET GAS VELOCITY HIGH THROUGHOUT BIOMASS GASIFIER		
United States	4,828,581	10/30/2007
LOW INLET GAS VELOCITY HIGH THROUGHOUT BIOMASS GASIFIER		
United States	filed 09/20/1985	New - Abandoned
United States	filed 01/22/1987	CIP - Abandoned
WIPO	WO 87/0171 -filed 09/15/1986	
Austria	239589	09/15/2006
Australia	591714	09/15/2006
Belgium	239589	09/15/2006
Switzerland	239589	09/15/2006
Germany	P3670507.1	09/15/2006
European Patent Con	239589	09/15/2006
France	239589	09/15/2006
United Kingdom	239589	09/15/2006
Italy	239589	09/15/2006
Japan	2059090	09/15/2006
Luxembourg	239589	09/15/2006
Netherlands	239589	09/15/2006
Sweden	239589	09/15/2006
Canada	1,271,634	09/18/2006
INTEGRATED BIOMASS GASIFICATION AND FUEL CELL SYSTEM		
United States		Pending - 04/06/2021
METHOD FOR HOT GAS CONDITIONING		
United States	5,494,653	08/27/2013
Canada		Pending - 02/27/2016
European Patent Con		Pending - 02/27/2016
SMALL-SCALE HIGH THROUGHPUT BIOMASS GASIFICATION SYSTEM AND METHOD		
United States		Pending - 11/17/2020

**AMENDED AND RESTATED COLLATERAL ASSIGNMENT
AND SECURITY AGREEMENT (PATENTS)**

THIS AMENDED AND RESTATED COLLATERAL ASSIGNMENT AND SECURITY AGREEMENT (PATENTS) (this "Agreement"), dated as of August 21, 2001, is executed by FUTURE ENERGY RESOURCES CORP., a Georgia corporation (the "Grantor"), in favor of TURNER FOUNDATION, INC., a Georgia non-profit corporation, as Collateral Agent (the "Collateral Agent"), on its behalf and on behalf of the Purchasers under the Amended and Restated Note Purchase Agreement (as defined below). Terms used herein but not defined herein shall have the meaning defined for those terms in the Amended and Restated Note Purchase Agreement (as defined below).

WITNESSETH:

WHEREAS, pursuant to the Note Purchase Agreement, dated as of January 16, 2001 (as amended prior to the date hereof, the "Original Note Purchase Agreement"), by and among the Grantor and the Purchasers, the Purchasers agreed to purchase, and the Grantor agreed to issue and sell to the Purchasers, the Grantor's Fixed Rate Senior Convertible Notes due January 16, 2004 (the "Original Notes"), as more specifically set forth in the Original Note Purchase Agreement; and

WHEREAS, pursuant to the terms of the Original Note Purchase Agreement, the Grantor was required to execute and deliver a Collateral Assignment and Security Agreement (Patents) (the "Original Patent Security Agreement") and to grant the liens and security interests provided for therein as security for its obligations under the Original Note Purchase Agreement and the Original Notes; and

WHEREAS, the Grantor has requested, and the Purchasers have agreed, to enter into that certain Amended and Restated Note Purchase Agreement, dated as of the date hereof (as amended, supplemented, restated or otherwise modified from time to time, the "Amended and Restated Note Purchase Agreement"), pursuant to which the Purchasers have agreed to purchase, and the Grantor has agreed to issue and sell to the Purchasers, the Grantor's Fixed Rate Senior Convertible Notes due January 16, 2004 (the "Amended and Restated Notes," and, together with the Original Notes, collectively, the "Notes"), as more specifically set forth in the Amended and Restated Note Purchase Agreement; and

WHEREAS, the Grantor desires to continue to secure its obligations under the Original Note Purchase Agreement, as amended and restated by the Amended and Restated Note Purchase Agreement, and under the Original Notes and to secure its obligations under the Amended and Restated Notes, and wishes to enter into this Agreement to amend and restate the Original Patent Security Agreement, as a continuation and not a novation, of its obligations thereunder;

NOW, THEREFORE, in consideration of the premises and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto agree as follows:

1. For purposes of this Agreement and in addition to terms defined elsewhere in this Agreement, the following terms shall have the meanings herein specified (such meaning to be equally applicable to both the singular and plural forms of the terms defined):

“NEPCO” shall mean National Energy Production Corporation, a Washington corporation.

“NEPCO Documents” shall mean (i) the Deferred Payment Agreement, dated as of July 3, 1997, between NEPCO and Grantor; (ii) the Security Agreement, dated as of July 3, 1997, between NEPCO and Grantor, and (iii) all other documents related thereto, including without limitation, all UCC financing statements, in each case as in effect on the date hereof.

“Patent License” means any written agreement now or hereafter in existence granting to the Grantor any right to practice any invention for which a Patent is in existence, including, without limitation, the agreements listed on Schedule I attached hereto.

“Patents” means all of the following: (i) all letters patent of the United States, all letters patent and all similar intellectual property in any other country, all recordings thereof, and all applications for letters patent of the United States or any other country, including, without limitation recordings and applications in the office or agency of the United States or any other country or any political subdivision thereof, including, without limitation, those referred to in Schedule I attached hereto, and (ii) all reissues, continuations, continuations-in-part, divisions, re-examinations or extensions thereof.

“Secured Obligations” means (a) (i) all principal of and interest (including, without limitation, any interest which accrues after the commencement of any case, proceeding or other action relating to the bankruptcy, insolvency or reorganization of Grantor) on the Notes issued pursuant to, and any other amount due from Grantor under, the Amended and Restated Note Purchase Agreement, and (ii) all other obligations (monetary or otherwise) to be performed by Grantor under the Amended and Restated Note Purchase Agreement or any other Transaction Agreement; and (b) all renewals or extensions of any of the foregoing.

2. As security for all Secured Obligations, the Grantor hereby grants and conveys a security interest to the Collateral Agent, for its benefit and the ratable benefit of the Purchasers, in, and collaterally assigns, pledges, mortgages and hypothecates to the Collateral Agent, for its benefit and the ratable benefit of the Purchasers, all of the Grantor's right, title and

interest in, to and under the following (collectively, the "Property"); provided, however, that the grant and conveyance by Grantor of such Property described on Schedule I shall not be effective on the date hereof, but shall be effective immediately and without any further action on the part of the Grantor or the Collateral Agent at the earliest time that the granting of a lien, security interest, pledge, mortgage, assignment or encumbrance is not prohibited under the NEPCO Documents, whether upon termination or satisfaction of the NEPCO Documents or otherwise:

(a) each Patent now or hereafter owned by the Grantor or in which the Grantor now has or hereafter acquires rights, and wherever located, including, without limitation, each Patent referred to in Schedule I hereto and any renewals thereof; and

(b) each Patent License now or hereafter held by the Grantor or in which the Grantor now has or hereafter acquires rights, to the extent each of the Patent Licenses does not prohibit the granting of a security interest in the rights thereunder and wherever located, including, without limitation, the Patent Licenses, if any, referred to in Schedule I hereto; and

(c) all products and proceeds of the foregoing, including, without limitation, any claim by the Grantor against third parties for past, present or future infringement of any Patent or breach of Patent Licenses, if any, including, without limitation, any Patent or Patent License referred to in Schedule I hereto.

Unless and until the Collateral Agent exercises the rights and remedies accorded to it under the Amended and Restated Security Agreement, dated as of the date hereof, among the Grantor, the Collateral Agent and the Purchasers (as amended, restated, or otherwise modified, the "Amended and Restated Security Agreement"), and by law with respect to the realization upon its security interest in and collateral assignment of the Property, the Collateral Agent hereby grants to the Grantor the exclusive, nontransferable, royalty-free right and license under the Property for the Grantor's own benefit and account, so that the Grantor may use and enjoy the Property in connection with its business operations and exercise rights and remedies with respect to the Property, but with respect to all Property being used in the Grantor's business, only in a manner consistent with the preservation of the current substance, validity, registration and the security interest and collateral assignment herein granted in such Property; provided, however, that the foregoing shall not impose an obligation on Grantor to continue to use any of the Property in the Grantor's business to the extent that such Property is not necessary in the normal conduct of its business. The Grantor agrees not to sell or assign its interest in, or grant any sublicense under, the license granted to the Grantor in this paragraph, except that the Grantor may sublicense the Property in the ordinary course of the Grantor's business but only in a manner consistent with the preservation of the current substance, validity, registration and the security interest and collateral assignment herein granted in such Property. Upon the exercise by the Collateral Agent of the rights and remedies accorded to it under the Amended and Restated Security Agreement and by

law with respect to the realization upon its security interest in and collateral assignment of the Property, the license granted under this paragraph to the Grantor shall terminate.

3. The Grantor does hereby further acknowledge and affirm that the representations, warranties and covenants of the Grantor with respect to the Property and the rights and remedies of the Collateral Agent with respect to the security interest in and collateral assignment of the Property made and granted hereby are more fully set forth in the Amended and Restated Security Agreement, the terms and provisions of which are incorporated by reference herein as if fully set forth herein.

4. This Agreement shall terminate upon termination of the Amended and Restated Security Agreement in accordance with Section 12 thereof. At any time and from time to time prior to such termination, the Collateral Agent may terminate its security interest in or reconvey to the Grantor any rights with respect to any or all of the Property. Upon termination of this Agreement and following a request from the Grantor, the Collateral Agent shall, at the expense of the Grantor, execute and deliver to the Grantor all deeds, assignments and other instruments as the Grantor may reasonably request (but without recourse or warranty by the Collateral Agent) in order to evidence such termination.

5. If at any time before the termination of this Agreement in accordance with Section 4, the Grantor shall obtain or acquire rights to any new Patent (including any Patent application), whether under a Patent License or otherwise, the provisions of Section 2 shall automatically apply thereto and the Grantor shall comply with the terms of the Amended and Restated Security Agreement with respect to such new Patent. The Grantor authorizes the Collateral Agent to modify this Agreement by amending Schedule I to include any future Patents and Patent Licenses covered by Section 2 or by this Section 5.

6. The Grantor further agrees that (a) neither the Collateral Agent nor any Purchaser shall have any obligation or responsibility to protect, defend, file prosecute, obtain or maintain the Property and the Grantor shall, at its own expense protect, defend, file, prosecute, obtain and maintain the same in accordance with the terms and conditions set forth in the Amended and Restated Security Agreement and in accordance with its prudent business judgment, (b) the Grantor shall forthwith advise the Collateral Agent promptly in writing upon detection of infringements of any of the Property being used in the Grantor's business and (c) if the Grantor fails to comply with the requirements of the preceding clause (a), the Collateral Agent or any Purchaser may do so in the Grantor's name or in its own name, but in any case at the Grantor's expense, and the Grantor hereby agrees to reimburse the Collateral Agent and the Purchasers for all reasonable expenses, including attorneys' fees, incurred by the Collateral Agent and the Purchasers in protecting, defending and maintaining the Property. For the purpose of permitting the Grantor to fulfill its obligations set forth above, the Collateral Agent hereby appoints the Grantor as its agent for the purpose of filing, prosecuting, obtaining, and maintaining, at its own expense, any new Patent (including any Patent application), and appointing attorneys and/or agents to appear before the U.S. Patent & Trademark Office and before corresponding foreign patent offices, to file, prosecute, obtain, and maintain Patents

including any Patent applications) on behalf of the Collateral Agent and the Grantor and, to the extent necessary under the Amended and Restated Security Agreement, on behalf of the Collateral Agent. Such appointment shall remain in effect unless and until the Collateral Agent revokes such appointment after the occurrence and during the continuance of an Event of Default.

7. All notices hereunder shall be in writing or by telecopy and shall be sufficiently given to Collateral Agent or Grantor if addressed or delivered to them as provided in the Amended and Restated Note Purchase Agreement.

8. Any provision of this Agreement which is prohibited or unenforceable in any jurisdiction shall, as to such jurisdiction, be ineffective to the extent of such prohibition or unenforceability without invalidating the remaining provisions of this Agreement or affecting the validity or enforceability of such provision in any jurisdiction.

9. This Agreement is for the benefit of the Collateral Agent, the Purchasers, and their permitted successors and assigns, and in the event of an assignment of all or any of the Secured Obligations, the rights hereunder, to the extent applicable to such Secured Obligations so assigned, may be transferred with such Secured Obligations. This Agreement shall be binding on Grantor and its successors and assigns; provided, however, that Grantor may not assign any of its rights or obligations hereunder.

10. This Agreement may be executed by the parties hereto in several counterparts, each of which shall be executed by Grantor and Collateral Agent and be deemed to be an original and all of which shall constitute together but one and the same Agreement.

11. (a) THIS AGREEMENT SHALL BE DEEMED TO BE MADE UNDER AND GOVERNED BY THE INTERNAL LAWS OF THE STATE OF GEORGIA, EXCEPT TO THE EXTENT THAT PERFECTION (AND THE EFFECT OF PERFECTION AND NON PERFECTION) AND CERTAIN REMEDIES MAY BE GOVERNED BY THE LAWS OF ANY JURISDICTION OTHER THAN GEORGIA.

(b) GRANTOR HEREBY IRREVOCABLY SUBMITS TO THE JURISDICTION OF ANY GEORGIA STATE OR FEDERAL COURT SITTING IN FULTON COUNTY, GEORGIA, IN ANY ACTION OR PROCEEDING ARISING OUT OF OR RELATING TO THIS AGREEMENT OR ANY OTHER TRANSACTION AGREEMENT, AND GRANTOR HEREBY IRREVOCABLY AGREES THAT ALL CLAIMS IN RESPECT OF SUCH ACTION OR PROCEEDING MAY BE HEARD AND DETERMINED IN SUCH GEORGIA STATE OR FEDERAL COURT. GRANTOR HEREBY IRREVOCABLY WAIVES, TO THE FULLEST EXTENT IT MAY EFFECTIVELY DO SO, THE DEFENSE OF ANY INCONVENIENT FORUM (FORUM NON CONVENIENS) TO THE MAINTENANCE OF SUCH ACTION OR PROCEEDING IN ANY SUCH COURT ARISING OUT OF OR RELATING TO THIS AGREEMENT OR ANY OTHER TRANSACTION AGREEMENT.

IN WITNESS WHEREOF, each of the parties hereto has caused this Agreement to be duly executed under seal by its duly authorized officers as of the date first above written.

FUTURE ENERGY RESOURCES CORP.

By:

Inge B. Fretheim
Name: Inge B. Fretheim
Title: President + CEO

Michelle Carter
Witness

Rich Cameron
Witness

STATE OF GEORGIA)
) ss.:
COUNTY OF Gwinnett)

On the 21st day of August, 2001 before me personally came Inge, to me personally known and known to me to be the person described in and who executed the foregoing instrument as the CEO of Future Energy Resources Corp., who being by me duly sworn, did depose and say that he is the CEO of Future Energy Resources Corp., the corporation described in and which executed the foregoing instrument; that the said instrument was signed on behalf of said corporation by order of its Board of Directors; that he signed his name thereto by like order; and that he acknowledged said instrument to be the free act and deed of said corporation.

Lisa M. Hoffmann
Notary Public

My Commission Expires:

2/18/02

[NOTARIAL SEAL]

[Signature Page To Amended and Restated Collateral Assignment of Patents]

TURNER FOUNDATION, INC., as Collateral
Agent

By: Michael V. Finley
Name: Michael V. Finley
Title: President

Will A. W., II
Witness

[Signature]
Witness

STATE OF GEORGIA)
) ss.:
COUNTY OF FULTON)

On the 21st day of August, 2001 before me personally came Michael V. Finley, to me personally known and known to me to be the person described in and who executed the foregoing instrument as the President of Turner Foundation, Inc., who being by me duly sworn, did depose and say that he is the President of Turner Foundation, Inc., the corporation described in and which executed the foregoing instrument; that the said instrument was signed on behalf of said corporation by order of its Board of Directors; that he signed his name thereto by like order; and that he acknowledged said instrument to be the free act and deed of said corporation.

Cindy Funchess Vaughn
Notary Public

My Commission Expires:

07-02-02

[NOTARIAL SEAL]

[Signature Page To Amended and Restated Collateral Assignment of Patents]

SCHEDULE I
to Amended and Restated Collateral Assignment
and Security Agreement (Patents)

COUNTRY	PATENT #	EXPIRATION DATE
BIOMASS GASIFICATION SYSTEM AND METHOD		
United States		Pending -12/21/2020
LOW INLET GAS VELOCITY HIGH THROUGHOUT BIOMASS GASIFIER		
United States	4,828,581	10/30/2007
LOW INLET GAS VELOCITY HIGH THROUGHOUT BIOMAS GASIFIER		
United States	filed 09/20/1985	New - Abandoned
United States	filed 01/22/1987	CIP - Abandoned
WIPO	WO 87/0171 -filed 09/15/1986	
Austria	239589	09/15/2006
Australia	591714	09/15/2006
Belgium	239589	09/15/2006
Switzerland	239589	09/15/2006
Germany	P3670507.1	09/15/2006
European Patent Con	239589	09/15/2006
France	239589	09/15/2006
United Kingdom	239589	09/15/2006
Italy	239589	09/15/2006
Japan	2059090	09/15/2006
Luxembourg	239589	09/15/2006
Netherlands	239589	09/15/2006
Sweden	239589	09/15/2006
Canada	1,271,634	09/18/2006
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United States		Pending - 04/06/2021
METHOD FOR HOT GAS CONDITIONING		
United States	5,494,653	08/27/2013
Canada		Pending - 02/27/2016
European Patent Con		Pending - 02/27/2016
SMALL-SCALE HIGH THROUGHPUT BIOMASS GASIFICATION SYSTEM AND METHOD		
United States		Pending - 11/17/2020