



## Annex 3: PIR Generic Offline Template

As of 4 May 2015



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### Basic Data / Basic Project & Finance Data

#### Basic Project Information

<b>PIMS ID</b>	740
<b>Project Title</b>	Removal of Barriers to Biomass Power Generation in India, Phase I

#### Project Contact Information

Role	Name	Email Address
<b>Project Implementing Partner</b>	Dr N P Singh, Advisor (Biomass) and NPD	npsinghmnes@nic.in
<b>Project Coordinator</b>	Mr. V K Jain	jainvk@nic.in
<b>UNDP Country Office Programme Officer</b>	Dr. S N Srinivas	sn.srinivas@undp.org
<b>GEF Operational Focal Point (OFP)</b>	Mr. Susheel Kumar	asmef.susheel@gov.in
<b>Other Partners</b>		

#### Project Milestones and Timeframe

<b>Revised planned closing date</b>	31 March 2016
	<i>Note: This is the date when the project is expected to have completed the terminal evaluation and is operationally closed in ATLAS. The planned closing date included in the UNDP project document can only be revised if a no-cost extension has been officially approved from the UNDP-GEF Executive Coordinator. Please upload this non-cost extension approval to the APPROVE and SUBMIT tab of the PIR. No project can be extended without this approval.</i>

#### Project Supervision

<b>Dates of Project Steering Committee/Board meetings during reporting period (30 June 2013 to 1 July 2014)</b>	6 <sup>th</sup> Meeting of the Project Steering Committee - February 10 2015 17 <sup>th</sup> Meeting of the Project Executive Committee – July 30 2014 18 <sup>th</sup> Meeting of the Project Executive Committee –December 05 2014
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#### Terminal PIR

<b>Is this the terminal PIR that will serve as the final project report?</b>	[No]
	<i>Note: The terminal PIR is the last PIR the project will submit and serves as the final project report. The terminal PIR can be submitted before the terminal evaluation is</i>

	<i>completed or it can be submitted in the same calendar year as the terminal evaluation is to be submitted.</i>
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**General Comments on Basic Data**

Please insert additional comments not explained above.
N/A

## Development Objective Progress / Progress Toward Development Objectives

Objective / Outcome: Description of Objective / Outcome	Description of Indicator	Baseline Level	Target Level at end of project	Level at 30 June 2014	Level at 30 June 2015
Overall project goal [impact]  To improve electricity supply without increasing GHG emissions through wide scale application of biomass energy technologies	Extent of supply and energy needs met by biomass power projects, reduction of CO2 emissions. By end of project additional MIPs up to 12 MWe of biomass power installed.		End of Project [EOP] target 2016: 18 MW supported for fuel linkage to existing biomass power plants.  Additional green field 12 MW cumulative capacity MIPs implemented.  Approx. 167,000 tCO2 reduced during project duration from green field projects and over 1.82 million tCO2 over lifetime of all MIPs implemented under project	<b>16.5 MW supported for fuel linkage to existing power plants.</b> <b>1.2 MWe green field biomass power plants implemented by Ankur Scientific in Gujarat.</b>  <b>The above plant has run between Aug 2011 and November 2013. It generated 6,484,202 kWh from greenfield projects. This translates to 6,350 tCO<sub>2</sub>.</b>	<b>16.5 MW supported for fuel linkage to existing power plants.</b> <b>1.2 MWe green field biomass power plants implemented by Ankur Scientific in Gujarat.</b>  <b>The above plant has run between Aug 2011 and November 2013. It generated 6,484,202 kWh from greenfield projects. This translates to 6,350 tCO<sub>2</sub>.</b>
Objective: To accelerate the adoption of environmentally sustainable biomass power technologies for captive and distributed biomass materials	Rate of commercial adoption of sustainable biomass power technologies in key states in India	No Model Investment Projects exist	By the end of Phase 1, 7 MIP's contracted covering co-generation, gasification and combustion technologies in 3-5 different states in India		

<p>in niche areas, through demonstration of project development models and establishment of sustainable business/support services network and undertaking enabling activities for removal of the key barriers.</p>		<p>Total 30 MW</p> <p>Fuel linkage support to existing biomass power plant in 18 MW.</p> <p>Small capacity 1 to 3 MW each Green field MIP<sup>s</sup> cumulating upto 12 MW<sup>1</sup></p>	<p><b>16.5 MW for fuel linkage support to existing biomass power plant completed. 20.5 MW is ongoing. Details are given below.</b></p> <ol style="list-style-type: none"> <li>1. MPPL - Muktsar – Biomass Combustion, 7.5 MW [Completed]</li> <li>2. Panduranga Sugar - Solapur - Cogeneration, 9 MW [Completed]</li> <li>3. Universal Biomass Energy Pvt. Ltd, Muktsar, Punjab, 14.5 MW [Ongoing]</li> <li>4. SLS Power Ltd., Nellore, Andhra Pradesh, 6 MW [Ongoing]</li> </ol> <p><b>1.2 MW Green field MIP completed. 3 MIPs [5MW] under progress. 6 MIPs [10.5 MW] under consideration</b></p> <ol style="list-style-type: none"> <li>1. Ankur Scientific Energy Technology Pvt. Ltd, Sankheda, Gujarat. 1.2 MW biomass gasification. Open access. [Completed]</li> <li>2. Ruchi Soya Industries Ltd. (RSIL), 1 MW fluidized bed gasification – ECN Netherlands technology, Maharashtra for captive and grid evacuation [Ongoing]</li> <li>3. Dee Vee Power, 2 MW biomass combustion based Distributed Power Generation Plant at Bellary, Karnataka [Ongoing]</li> <li>4. Kandra Energy: 2 MW biomass combustion based Distributed Power Generation Plant at Bellary, Karnataka.</li> </ol> <p><b>Greenfield MIPs under consideration are</b></p> <ol style="list-style-type: none"> <li>1. M/s Cummins Cogeneration Pvt Ltd., Tamil Nadu – 1 MW Gasifier [under commissioning];</li> <li>2. M/s Vana Vidyut Pvt. Ltd, Tamil Nadu - 2 MW / Gasifier [under commissioning];</li> <li>3. M/s Ram Laxman Para Boiled Rice Mill Pvt. Ltd, AP- 2 MW Combustion [achieved financial closure];</li> <li>4. State Farms Corporation of India Limited (SFCI), Rajasthan - 1.5 MW/ Gasification [DPR completed and Bid Process</li> </ol>	<p><b>37 MW for fuel linkage support to existing biomass power plant completed. Details are given below.</b></p> <ol style="list-style-type: none"> <li>1. MPPL - Muktsar – Biomass Combustion, 7.5 MW [Completed]</li> <li>2. Panduranga Sugar - Solapur - Cogeneration, 9 MW [Completed]</li> <li>3. Universal Biomass Energy Pvt. Ltd, Muktsar, Punjab, 14.5 MW [Completed]</li> <li>4. SLS Power Ltd., Nellore, Andhra Pradesh, 6 MW [Completed]</li> </ol> <p><b>1.2 MW Green field MIP completed. 1 MIP (1 MW) under commissioning; 2 MIPs [4MW] under progress. 5 MIPs [7 MW] under consideration</b></p> <ol style="list-style-type: none"> <li>1. Ankur Scientific Energy Technology Pvt. Ltd, Sankheda, Gujarat. 1.2 MW biomass gasification. Open access. [Completed]</li> <li>2. Ruchi Soya Industries Ltd. (RSIL), 1 MW fluidized bed gasification – ECN Netherlands technology, Maharashtra for captive and grid evacuation [Under Commissioning]</li> <li>3. Dee Vee Power, 2 MW biomass combustion based Distributed Power Generation Plant at Bellary, Karnataka [Ongoing]</li> <li>4. Kandra Energy: 2 MW biomass combustion based Distributed Power Generation Plant at Bellary, Karnataka. [Ongoing]</li> </ol> <p><b>Greenfield MIPs under consideration are</b> M/s Cummins Cogeneration Pvt Ltd., Tamil Nadu – 1 MW Gasifier [under commissioning];</p> <ol style="list-style-type: none"> <li>1. Three biomass power plants (2MW + 2MW + 1MW) in three islands in Lakshadweep with Lakshadweep Authorities– (ongoing)</li> <li>2. One biomass power plant - 1MW in Andaman &amp; Nicobar islands with Andaman &amp; Nicobar Authorities (ongoing)</li> </ol>
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<sup>1</sup> This is in addition to already implement MIPs (Both green field and biomass fuel linkage based) Support for Fuel linkages: (Universal Biomass Energy Pvt. Ltd, Muktsar, Punjab, 14.5 MW; SLS Power Ltd., Nellore, Andhra Pradesh, 6 MW; Completed MIPs (MPPL - Muktsar – Biomass Combustion, 7.5 MW; Panduranga Sugar - Solapur - Cogeneration, 9 MW; Ankur, Sankheda, Gujarat – 1.2 MW gasifier based power plant, Ruchi Soya (RSIL), 1 MW – fluidized bed biomass gasification plant planned to be set up at Washim, Maharashtra; will be executed by M/s Thermax Ltd)

				<p>Management for selection of Technology Provider is underway;</p> <p>5. M/s Apex Eneritech Pvt. Ltd, Gujarat, 2 MW/ Gasification [financial closure is under process]; and</p> <p>6. M/s Global Energy Private Limited, Mizoram 2 MW/ Combustion [yet to be decided].</p>	
<p>Outcome 1: Technology package benchmarking and validation for different biomass power technologies, including feasibility of energy plantation.</p>	<p>Status of manufacturing capacities and standards for different biomass power technologies.</p>	<p>Poor reliability and inadequate information of biomass power technologies, both captive and distributed and on projects available to the major stakeholders.</p>	<p>By the end of phase 1, the parameters and technical standards for the efficient biomass power technologies targeted by the project have been finalized.</p>	<p>Revised the targets giving more clarity on the indicator and targets as below and discontinued to report the progress from this reporting period.</p>	
<p><b>Outcome-1: Technology package benchmarking &amp; validation for different biomass power technologies, including feasibility of energy plantation</b></p>	<ul style="list-style-type: none"> <li>Study report on potential of biomass hybrid (solar thermal, biogas, etc) technology for power generation documented and submitted to PMU.</li> <li>DPRs of potential biomass-hybrid finalized and submitted to MNRE.</li> </ul>	<p>0</p> <p>0</p>	<p>1</p> <p>1</p>	<p>A Consultancy assignment for exploring the potential and feasibility of integration of Solar Thermal Technology with the existing Combustion based Biomass Power Plants was awarded to M/s Steag Energy Services (India) Pvt Ltd and is under progress. The Inception Meeting was organized on 9 May 2014.</p> <p>An EoI was floated for inviting interest on hybridization from existing Biomass Power projects. Sixteen existing project developers responded to the EoI. The final selection of site for the DPR will be made. Some of the parameters that will be considered are plant design, performance, land availability and financial data analysis.</p>	<p>The draft Global Status report was submitted by the consultant M/s Steag Energy Services. Expert Committee has provided comments. Consultant will submit the revised draft of the Global Status Report based on the comments and suggestions by end of July 2015.</p> <p>A meeting of the sixteen existing project developers who had responded to the first EoI was organized. But the developers did not express interest in investing in the project due to the overall state of biomass sector and reluctance of financial institutions to fund biomass related projects.</p> <p>The 2nd Expression of Interest (EoI) inviting proposals from project developers for technical support for integrating solar thermal technology into existing biomass power plants was advertised and no response was received against it.</p>

	Developed benchmarks for MIPs and their validation through a technical team.	0	3 (1 each for 3 different biomass power technologies supported under the project)	Activities were not undertaken during this reporting period. Will be initiated during third quarter of 2014.	Not taken up during the reporting period.
	Technology performance and evaluation of benchmarks (a) Learning curves established for combustion, gasification and cogeneration technologies (in grid connected mode, and captive mode) (b) Levelised cost of electricity data available for different biomass energy technologies	0	6 (for three types of technologies in two modes i.e. grid and captive)  6 (for three types of technologies in two modes i.e. grid and captive)	Activities were not undertaken during this reporting period. Will be initiated during AWP 2015.  Activities were not undertaken during this reporting period. Will be initiated during third quarter of 2014.	Not taken up during the reporting period.
	Study report on feasibility of dedicated energy plantation on wasteland. DPRs with potential PPP models prepared and submitted to PMU.	0	1	Activities were not undertaken during this reporting period. Will be initiated during third quarter of 2014.  Feasibility of establishing energy plantation for biomass production on degraded land/wasteland was taken up. DESL, a consulting firm has been contracted to carry out the assignment. Following are the focus states namely, Rajasthan, Gujarat, Maharashtra, Orissa, Bihar, West Bengal and Mizoram. Further target districts have been identified in the following three states for which detailed project reports were developed and the same are under review by the respective state nodal agencies, and the PMU.  <ul style="list-style-type: none"> <li>Rajasthan: The DPR has been developed in partnership with State Farm Corporation on India in Sriganaganagar district;</li> </ul>	The State wise reports for Bihar, Odisha and Rajasthan were finalized. It provides Identification of wastelands, review of existing policy and regulatory frameworks and prospective plan. The reports were shared with the State Nodal Agencies.  The four DPRs [Detailed Project Report] were developed by M/s DESL were in partnership with TATA Power Ltd. (Odisha and Maharashtra); National Seed Corporation (Rajasthan) and Global Energy Ltd. (Mizoram). <ol style="list-style-type: none"> <li>Dedicated Energy Plantation on Wind Farms. Tehsil Patan, District Satara, Maharashtra.</li> <li>Plantation of Beema Bamboo for 2.0 &amp; 8.0 MW Biomass Power Projects. District Nayagarh, Khordha and Kandhamal, Odisha.</li> <li>Plantation of Prosopis Juliflora at Jetsar, Farm. District Sri Ganganagar, Rajasthan.</li> </ol> Of the four, the DPR with Global Energy Ltd. could not be taken forward as the Project Developer could not identify land in Mizoram due to political unrest in the regions, however, in the case of the

				<ul style="list-style-type: none"> <li>• Maharashtra: The DPR has been developed in partnership with Tata Power in Satara district;</li> <li>• Odisha: The DPR has been developed in partnership with Odisha Renewable Energy development Agency in Navagarh District.</li> </ul>	National Seed Corporation (NSC) and TATA Power Ltd the assignment was considerably delayed due to lack of response from Project Developers for their commitment on the Detailed Project Reports for making it bankable. A final commitment from either Project Developers could not be obtained despite repeated follow-ups and meetings by M/s DESL, the PMC and OREDA. It was decided post a final meetings Chaired by Advisor (Biomass) & NPD on 20 January 2015 that the assignment may be foreclosed due to lack of response from Project Developers.
	A study on the Socio-Economic and Environment Impact of Biomass Power plants on the local rural economy completed and report submitted to PMU	0	1	Activities were not undertaken during this reporting period. Will be initiated during AWP 2015.	A study on the “Socio-Economic and Environment Impact of Biomass Power plants on the local rural economy” has been initiated and M/s Ernst & Young have been selected as the Consultants. The parameters for collection of data have been finalized in discussion with the Consultants. The parameters are, <ol style="list-style-type: none"> <li>1. Social indicators: Effect on education due to increased earnings/income, Effect on health due to increased earnings, Sanitation, Effect on migration due to increased earnings, Community mobilization indicators</li> <li>2. Economic indicators: Increase in labor and wages, additional income for farmers/ small entrepreneurs, Economic value of plantation raised, Economic value of additional infrastructure</li> <li>3. Environmental indicators: GHG emission avoidance, Effect on water availability and soil quality.</li> </ol>
<b>Outcome-2: Enhanced Capacities and confidence of Project Promoters, Financial Institutions, Regulators, Policy Makers, SNAs, other stakeholders through effective information dissemination &amp; dissemination program, along with capacity building initiatives</b>	Enhanced capacities of key stakeholders involved in the facilitation and implementation of selected biomass power technologies	Wide variation in policy and regulatory environment and inadequate information on various aspects of BPP and bagasse cogeneration in sugar industries, to project developers & other key stakeholders	By the end of phase 1, pilot portfolio of project profiles developed, model formats/agreements established for the targeted biomass technologies (on fuel supply, energy purchase, project development & management) and promotional material and awareness raised significantly in pilot states	Revised indicators along with baseline and targets giving more clarity as below. 4 workshops for awareness on biomass power for 1 to 2 days each was conducted in which approximately 200 people participated to sensitise the investors on investment in biomass. 2 skill development trainings were conducted for 15 days each to develop skills in operation and maintenance of biomass gasifiers. Two workshops for one day each were conducted of stakeholders with regulatory authorities in which 200 people participated.  In all 10 issues of ‘Bioenergy’ and one issue of ‘BioPower’ were published, circulated and uploaded on UNDP website and most of them circulated on UN Solution Exchange. Investor manual on biomass power was prepared. A 6 minute Audio-visual was prepared on Biomass power based on MIP [model investment project] at Ankur.	No fresh activities were taken up during the reporting period.

	<ul style="list-style-type: none"> <li>Quarterly Newsletter – Bio energy India published and disseminated.</li> <li>Good Practice documents (model DPR and fuel purchase agreement, energy purchase/ wheeling/ banking, and project development agreements) of biomass power plants prepared.</li> </ul>	0  0	12 by EoP (2017; in addition to 10 issues published during 2009-11)  1 in each category (total 3 good practice documents)	11 The first issue of the quarterly magazine called the BioPower India was published in January-March 2014. Hard copies of every issue of the magazine are circulated to about 700 stakeholders including Regulators, Policy Makers, Project Developers, Financial Institutions etc. Further this is circulated on UN Solution Exchange platform, and project page on UNDP website.  This activity was not undertaken during the reporting period. Will be initiated during AWP 2015.	13 In all 10 issues of ‘Bioenergy’ and 3 issue of ‘BioPower’ were published. About 700 hard copies were circulated. The recipients of hard copies were Regulators, Policy Makers, Project Developers, Financial Institutions etc. Softcopies were circulated through UN Solution Exchange Climate Change community and uploaded on UNDP website. Links for 12 of them are given below;  <b>BioPower</b> 1. <a href="http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy/Issue%203%20-%20July-September%202014.pdf">http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy/Issue%203%20-%20July-September%202014.pdf</a> 2. <a href="http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy/Issue%202%20-%20April-June%202014.pdf">http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy/Issue%202%20-%20April-June%202014.pdf</a> 3. <a href="http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy/Issue%201%20-%20Jan-%20Mar%202014.pdf">http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy/Issue%201%20-%20Jan-%20Mar%202014.pdf</a> <b>Bio Energy</b> 4. <a href="http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy%20Magazine-MNRE/Issue%209%20&amp;%2010%20-%20Jul%20-%20Dec%202011.pdf">http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy%20Magazine-MNRE/Issue%209%20&amp;%2010%20-%20Jul%20-%20Dec%202011.pdf</a> 5. <a href="http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy%20Magazine-MNRE/Issue%208%20-%20April%20-%20June%202011.pdf">http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy%20Magazine-MNRE/Issue%208%20-%20April%20-%20June%202011.pdf</a> 6. <a href="http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy%20Magazine-MNRE/Issue%207%20-%20Mar%202011.pdf">http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy%20Magazine-MNRE/Issue%207%20-%20Mar%202011.pdf</a> 7. <a href="http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy%20Magazine-MNRE/Issue%206-%20Dec%202010.pdf">http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy%20Magazine-MNRE/Issue%206-%20Dec%202010.pdf</a> 8. <a href="http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy%20Magazine-MNRE/Issue%205-%20July-%20sept%202010.pdf">http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy%20Magazine-MNRE/Issue%205-%20July-%20sept%202010.pdf</a> 9. <a href="http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy%20Magazine-MNRE/Issue%204%20-%20June%202010.pdf">http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy%20Magazine-MNRE/Issue%204%20-%20June%202010.pdf</a> 10. <a href="http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy%20Magazine-MNRE/Issue%203%20-%20March%202010.pdf">http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy%20Magazine-MNRE/Issue%203%20-%20March%202010.pdf</a> 11. <a href="http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy%20Magazine-MNRE/Issue%202-%20Dec%202009.pdf">http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy%20Magazine-MNRE/Issue%202-%20Dec%202009.pdf</a> 12. <a href="http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy%20Magazine-MNRE/Issue%201-%20Sep%202009.pdf">http://viainfotech.biz/Biomass/theme5/document/Magazines/Bioenergy%20Magazine-MNRE/Issue%201-%20Sep%202009.pdf</a>  M/s MITCON , wherein the following documents have been developed in 2010:



					<ol style="list-style-type: none"> <li>1. Model DPR, project development agreement, fuel purchase agreement and energy purchase;</li> <li>2. Model bid documents for Biomass/Bagasse Cogeneration projects.</li> </ol> <p>Additionally states already follow standardized formats for all such agreements as per state specific rules and regulations. These are available with the SNAs and some can be viewed at <a href="http://viainfotech.biz/Biomass/theme5/library-forms.php">http://viainfotech.biz/Biomass/theme5/library-forms.php</a></p>
	<ul style="list-style-type: none"> <li>• Discussion papers prepared on various issues.</li> </ul>	0	6	<p>4</p> <p>The following four papers were prepared and presented:</p> <ol style="list-style-type: none"> <li>1. V K Jain, Tanushree Bhowmik, A Chilamburaj. Biomass Power Issues and Challenges – Discussion Paper. In proceedings of ‘Regulatory and Financial Barriers and Challenges in Power Generation using Biomass’. India International Centre, New Delhi. 9 June 2014. Pp.21-36.</li> <li>2. Ashok Chaudhuri. General Manager, Ankur Scientific Energy Technologies Pvt. Limited, Vadodara. “Biomass Gasification and Distributed Power Generation for Sustainable Economic Development of Rural India and Africa”. Presented in UNDP Session on Biomass Power – Business Opportunities. CII-Exim Bank Conclave on India-Africa Project Partnership, March 18-20, 2012. Hotel Taj Palace, New Delhi.</li> <li>3. K L Bansal, Director, “Malwa Power Plant Limited, Muktsar Biomass Power: The next Wave in Power Generation”. Presented in UNDP Session on Biomass Power – Business Opportunities. CII-Exim Bank Conclave on India-Africa Project Partnership, March 18-20, 2012. Hotel Taj Palace, New Delhi.</li> <li>4. V K Jain, Director, Ministry of New and Renewable Energy (MNRE). “Biomass Power in India – An Overview”. Presented in UNDP Session on Biomass Power – Business Opportunities. CII-Exim Bank Conclave on</li> </ol>	<p>5</p> <p>The following five papers were prepared and presented:</p> <ol style="list-style-type: none"> <li>1. V K Jain, Tanushree Bhowmik , “Overview of the Indian Biomass Power sector – Challenges &amp; Trends” International Renewable Energy Congress held in Sousse, Tunisia during 24-26 March 2015.</li> <li>2. V K Jain, Tanushree Bhowmik, A Chilamburaj. Biomass Power Issues and Challenges – Discussion Paper. In proceedings of ‘Regulatory and Financial Barriers and Challenges in Power Generation using Biomass’. India International Centre, New Delhi. 9 June 2014. Pp.21-36.</li> <li>3. Ashok Chaudhuri. General Manager, Ankur Scientific Energy Technologies Pvt. Limited, Vadodara. “Biomass Gasification and Distributed Power Generation for Sustainable Economic Development of Rural India and Africa”. Presented in UNDP Session on Biomass Power – Business Opportunities. CII-Exim Bank Conclave on India-Africa Project Partnership, March 18-20, 2012. Hotel Taj Palace, New Delhi.</li> <li>4. K L Bansal, Director, “Malwa Power Plant Limited, Muktsar Biomass Power: The next Wave in Power Generation”. Presented in UNDP Session on Biomass Power – Business Opportunities. CII-Exim Bank Conclave on India-Africa Project Partnership, March 18-20, 2012. Hotel Taj Palace, New Delhi.</li> <li>5. V K Jain, Director, Ministry of New and Renewable Energy (MNRE). “Biomass Power in India – An Overview”. Presented in UNDP Session on Biomass Power – Business Opportunities. CII-Exim Bank Conclave on India-Africa Project Partnership, March 18-20, 2012. Hotel Taj Palace, New Delhi.</li> </ol>

	<ul style="list-style-type: none"> <li>User interactive knowledge portal for the Biomass Power Sector launched and regularly updated over project period.</li> </ul>	0	1	<p>India-Africa Project Partnership, March 18-20, 2012. Hotel Taj Palace, New Delhi.</p> <p>A web based Knowledge Portal on Biomass Power is being developed. The key objective is to develop a user friendly single point knowledge source for information/data related to generation of power. It includes grid interactive, off-grid, captive applications for electricity generation and thermal energy from biomass. IDAM Infrastructure Pvt. Ltd. is implementing the assignment.</p> <p>6 consultative meetings happened so far. A working group to look into barriers and challenges in promotion of biomass power has been set up. NPD of biomass power project is the chairman and NPC is the member convener. The objectives of the working group are to:</p> <ul style="list-style-type: none"> <li>Review barriers and challenges faced by the sector and identify key areas related to tariff, financing, secured fuel supply</li> <li>Suggest suitable policy intervention</li> <li>Suggest actions required at regular intervals for re-validation of Biomass Resource Atlas and also initiate studies on fuel pricing</li> <li>Discuss financial restructuring, catchment area policy for biomass and project development.</li> </ul> <p>Five consultative meetings were held with the following;</p> <ul style="list-style-type: none"> <li>Indian Biomass Power Association (IBPA),</li> <li>Orissa Renewable Energy Development Agency</li> <li>Project Developers like State Farm Corporation of India and</li> <li>Lakshadweep Renewable Energy Development Agency</li> </ul> <p>Following results that can be attributed to working recommendations</p>	<p>A web based Knowledge Portal – <a href="http://www.biomasspower.gov.in">www.biomasspower.gov.in</a> has been developed. The knowledge portal is expected to serve as user-friendly single point source for information/data related to biomass power. It covers generation of power – grid interactive as well as off – grid and</p>
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	<ul style="list-style-type: none"> <li>• Consultative meetings with SNAs, SEBs, industry associations and project promoters organized and documented.</li> </ul>	0	6	<ul style="list-style-type: none"> <li>• Central Electricity Regulatory Commission (CERC) revised the tariff for biomass power plants</li> <li>• CERC issued new Tariff Guidelines for Gasifiers.</li> <li>• 'Performance/ Viability of biomass based plants operating in India, including prevailing prices'.</li> </ul> <p>2</p> <p>A team consisting of representatives from PMU, UNDP and potential investor attended 22nd European Biomass Conference held at Hamburg, Germany between 23 June 2014 and 26 June 2014. The team consisted of NPC, NPM of the project, UNDP and representative from SFCI who is potential investor in a biomass power project. The purpose of participation was to understand the technology progress, benchmarking, issues, solutions and scope for learning from outside country. The lessons learnt were to help the revision of LFA, restructuring technical, financial incentive, etc. Following are the key conclusions and follow up action points;</p> <ol style="list-style-type: none"> <li>1. Team also visited M/s Class's biomass processing equipment manufacturing facility. SFCI is likely to follow up collaboration.</li> <li>2. Team also had meetings with Eqtec, Bulgaria and exploring transfer of gasification technology.</li> <li>3. Meeting was held with ETA Renewables, EU for partnership in knowledge management in the biomass sector.</li> </ol>	<p>captive applications; and thermal energy from biomass. The Web Portal was formally launched by Mr. Piyush Goyal, Hon'ble Minister (IC) of State for Power, Coal and New &amp; Renewable Energy on 14 May 2015. The web portal is currently accessible through the MNRE website.</p> <p>A web based Knowledge Portal – <a href="http://www.biomasspower.gov.in">www.biomasspower.gov.in</a> has been developed. The knowledge portal will be a user-friendly single point source for information/data related to generation of power – grid interactive as well as off – grid and captive applications; and thermal energy from biomass. The Web Portal was formally launched by Mr. Piyush Goyal, Hon'ble Minister (IC) of State for Power, Coal and New &amp; Renewable Energy on 14 May 2015. The web portal is currently accessible through the MNRE website.</p> <p><b>Target has been met.</b></p> <p>A working group to look into challenges in promoting biomass power has been set up. NPDP of biomass power project is the chairman and NPC is the member convener. The objectives of the working group are to:</p> <ul style="list-style-type: none"> <li>• Review barriers and challenges faced by the sector and identify key areas related to tariff, financing, secured fuel supply</li> <li>• Suggest suitable policy intervention</li> <li>• Suggest actions required at regular intervals for re-validation of Biomass Resource Atlas and also initiate studies on fuel pricing</li> <li>• Discuss financial restructuring, catchment area policy for biomass and project development.</li> </ul> <p>Five consultative meetings were held with the following;</p> <ul style="list-style-type: none"> <li>• Indian Biomass Power Association (IBPA),</li> <li>• Orissa Renewable Energy Development Agency</li> <li>• Project Developers like State Farm Corporation of India and</li> <li>• Lakshadweep Renewable Energy Development Agency</li> <li>• Andaman &amp; Nicobar Renewable Energy Development Agency</li> </ul> <p>Following results that can be attributed to recommendations by working group, namely</p> <ul style="list-style-type: none"> <li>• Central Electricity Regulatory Commission (CERC) revised the tariff for biomass power plants around Rs.7 per kWh. Now SRECs have to accept these CERC guidance.</li> <li>• CERC issued new Tariff Guidelines for Gasifiers.</li> <li>• 'Performance/ Viability of biomass based plants operating in India, including prevailing prices'.</li> </ul> <p><a href="http://www.cercind.gov.in/2015/orders/SO4.pdf">http://www.cercind.gov.in/2015/orders/SO4.pdf</a> (March 2015 order)  <a href="http://www.cercind.gov.in/2014/orders/SO354.pdf">http://www.cercind.gov.in/2014/orders/SO354.pdf</a> (May 2014 order)</p>
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	<ul style="list-style-type: none"> <li>Conduct information and knowledge sharing programmes through organized study tours/missions involving focused states</li> </ul>	0	6		<p>3 PMU officials and other stakeholders attended the International Renewable Energy Congress held in Sousse, Tunisia during 24-26 March 2015.</p> <p>A team consisting of representatives from PMU, NPC and NPM, UNDP and potential investor – National Seed Corporation attended 22nd European Biomass Conference held at Hamburg, Germany between 23 June 2014 and 26 June 2014. The purpose of participation was to understand the technology progress, benchmarking, issues, solutions and scope for learning from outside country.;</p> <ol style="list-style-type: none"> <li>Team also visited M/s Class’s biomass processing equipment manufacturing facility. SFCI is likely to follow up collaboration.</li> <li>Team also had meetings with Eqtec, Bulgaria and exploring transfer of gasification technology.</li> <li>Meeting was held with ETA Renewables, EU for partnership in knowledge management in the biomass sector.</li> </ol> <p>The lessons learnt were to help the revision of LFA, restructuring technical, financial incentive, etc.</p>
<b>Outcome 3: Development of business, commercial and support services networks in focused States.</b>	Definition and implementation of biomass power business dissemination models in the project pilot states.	Inadequate Institutional Framework at National, Regional and Local Levels for large scale multiplication of biomass power technology and projects.	By the end of phase 1, the appropriate biomass power business models have been widely disseminated and established in the initial pilot states	Revised the targets giving more clarity on the indicator and targets as below and discontinued to report the progress here from this reporting period.	
Output 3.1 Information sharing and networking of Biomass Power practitioners at the regional/state level strengthened	National level event organized annually involving participant of various partners, stakeholders, project developers. Various state/regional level events organized involving particular category of	0	3 (by EoP)	<b>Target was met.</b> One was held in Shimla during last reporting period. This workshop contributed to revision of FIT [Feed In Tariff] for biomass power. Second workshop was held at Vadodara in April 2013. Third, a one day workshop on ‘Regulatory and Financial Barriers and Challenges in Power Generation from Biomass’ was held on 9 June 2014. The workshop was well represented by stakeholders, Chairpersons and Members of Central Electricity Regulatory Commission, State	<b>No new activity taken up.</b>

	stakeholders to brainstorm/discuss key topics/issue by sharing expertise, knowledge.			<p>Electricity Regulatory Commissions, and senior officials of State Energy Departments, State Nodal Agencies, Distribution Companies from more than 15 states across the country, officials from UNDP, Financial Institutions, Indian Biomass Power Association and Biomass Project Developers. 110 persons participated in the event. Following were the major recommendations;</p> <ul style="list-style-type: none"> <li>• CERC has increased the FIT from INR 4 to 6 per kWh earlier to INR 7 plus per kWh. SERCs should consider implementation of the guidelines.</li> <li>• States should have mechanisms to revise tariffs periodically depending on price escalations.</li> <li>• SERCs should monitor enforcement of Renewable Purchase Obligation. Separate RPO for biomass power may be considered.</li> <li>• MNRE should approach Ministry of Rural Development for including biomass collection in the rural areas under the MNREGA scheme.</li> <li>• MNRE should leverage NCEF [National Clean Energy Fund] for supporting revival of biomass power projects.</li> <li>• Separate guidelines of Feed In Tariff for submegawatt will be helpful for small scale power generation, small entrepreneurs, and small businesses.</li> </ul>	
Outcome 4: Creation of fund for contingent financing	Contingent financing fund with initial deal flows in operation through designated financial institutions	Inadequate skills, experience and commitment to provide finance to biomass power projects	By the end of phase 1, 7 MIP's successfully facilitated by the contingent financing facilities made available through the selected financial institutions, together with the full design of a non-financial institutions	<p>As per the revised LFA, the Contingent Funding has been discontinued to report the progress here from this reporting period.</p> <p>As it was reported in 2012, a study was undertaken with respect to Contingent financing for MIPs, and it revealed that 18 - 20 banks were willing to provide term loans to the projects. Therefore, it is recommended that contingent financing is not needed from the project and shall discontinue developing this further.</p>	<p>Revised LFA proposed to discontinue Contingent Funding, which was approved by Project Steering Committee.</p> <p>This decision was taken based on a study conducted which 2012 revealed that 18 - 20 banks were willing to provide term loans to the projects.</p>

			specific guarantee mechanism		
Outcome 5: Model Investment Projects (MIPs)	Model investment projects (MIP) commissioned and implementation started.	Models for implementing BPP do not exist either for captive or distributed biomass resources.	By the end of phase 1, 7 model investment projects (MIP) will have been successfully commissioned and have started initial implementation in 3-5 states demonstrating the 3 different biomass power technologies targeted. (Cumulative capacity of 12 MW)	2 MIPs cumulating to 16.5 MW completed and 2 MIPs cumulating to 20.5 MW under progress under the category of fuel linkage to existing biomass power plants.  1 MIP [1.2 MW] under greenfield project completed, 3 MIPs [5 MW] committed and are under various stages of commissioning and 6 [9.5 MW] more under consideration/progress cumulating to 16.7 MW.	4 MIPs cumulating to 37 MW under the category of fuel linkage to existing biomass power plants.  1 Green field MIP completed (1.2 MW). 1 MIP (1 MW) is under commissioning. 2 MIPs [4MW] under progress. 5 MIPs [7 MW] under consideration.

Output- 5.1 Commissioning and stabilization of MIPs Implementation of green-field MIPs	# Quantity of MW supported under fuel linkage to existing biomass power plants	0	18 MW fuel linkage to existing biomass power plants supported	16.5 MW for fuel linkage support to existing biomass power plant completed. Support to another 20.5 MW [2 projects] is under progress. Support fuel linkages, MIPs ongoing are – <b>Universal Biomass Energy Pvt. Ltd, Muktsar, Punjab, 14.5 MW:</b> M/s Universal Biomass has set up additional 18 decentralized biomass depots (DBD) within a radius of 100 km to collect biomass. Various crop residues - cotton stalk, paddy straw, mustard stalk, etc. are collected, processed and dispatched to the main power plant. <b>SLS Power Ltd., Nellore, Andhra Pradesh, 6 MW:</b> M/s SLS Power has set up 3 decentralized biomass depots (DBD) within a radius of 50 km to collect various residues - cotton stalk, paddy straw, sugar cane trash, etc. to replace rice husks which is currently being used as main fuel.	37 MW for fuel linkage support to existing biomass power plant completed. Support for Fuel linkages, MIPs completed are – <b>Universal Biomass Energy Pvt. Ltd, Muktsar, Punjab, 14.5 MW:</b> Set up additional 18 decentralized biomass depots (DBD) within a radius of 100 km to collect biomass. Various crop residues - cotton stalk, paddy straw, mustard stalk, etc. are collected, processed and dispatched to the main power plant. Benefits: <ul style="list-style-type: none"> <li>• Reduction in landed fuel cost by USD 4.2 - 4.5/MT</li> <li>• Developed modification in boiler which can directly handle paddy straw bales, avoiding chipping of paddy straw</li> <li>• Plant has generated employment opportunities for about 1000 people from the local community in surrounding areas for collection, processing, transportation of biomass</li> </ul> <b>SLS Power Ltd., Nellore, Andhra Pradesh, 6 MW:</b> M/s SLS Power has set up 4 DBD within a radius of 50 km to collect various residues - cotton stalk, paddy straw, sugar cane trash, etc. to replace rice husks which is currently being used as main fuel. Benefits: <ul style="list-style-type: none"> <li>• Reduction in landed fuel cost by USD 5 - 6/MT</li> <li>• Plant has generated employment opportunities for about 900 people from the local community in surrounding areas for collection, processing, transportation of biomass</li> </ul> <b>MPPL - Muktsar – Biomass Combustion, 7.5 MW:</b> Facility included covered biomass storage shed, harvesting cum chipping device, material handling equipment (JCB) cargo canter to transport biomass from fields and weigh bridges at collection centers. It is estimated that all these facilities helped reducing biomass losses by 5-10%. The biomass supply and conversion has created local employment, increased income to farmers and understood to have positively impacted on <b>Panduranga Sugar - Solapur - Cogeneration, 9 MW:</b> The project supported procurement of trash bailers with technology from Netherlands. Sugarcane trash use was unique feature of this project which was not common. 1 MIP [1.2 MW] under green field project completed, 3 MIPs [5 MW] committed and are under various stages of commissioning and 5 [9.5 MW] more under consideration/progress cumulating to 16.7 MW.
	# Quantity of MW green field MIPs	0	12 MW green field biomass projects covering	<ul style="list-style-type: none"> <li>• 9 MW cumulative gasification/combustion based including open access sale</li> <li>• 3 MW for non-bagasse based co/tri-generation using captive biomass, for captive use for grid interactive local mini-grid or small gasifier systems for greening telecom towers</li> </ul>	

				<p><b>Ankur Scientific Energy Technology Pvt. Ltd, Sankheda, Gujarat commissioned 1.2 MW power plant based on biomass gasification.</b> This is perhaps one of the first small scale 'open access' plant [Open access - power produced is sold to a third party by wheeling the power through state grid]. The electricity was sold to Aditya Birla Insulators, [a company producing electrical components] through PPA for Rs 5.25 per kWh. Ankur was also leveraging REC benefits [Rural Electricity Certificate]. However, the unit halted operations in December 2013. PMU is examining the reasons and trying to discuss with all the concerned [Ankur, Aditya Birla and Gujrat Electricity authorities] to engage in the process of revival. One of the reasons is that the REC [Renewable Energy Certificate] prices are floored which resulting in revenue is earned being inadequate for Ankur to manage the operations.</p> <p><b>Ruchi Soya Industries Ltd. (RSIL):</b> 1 MW fluidized bed biomass gasification plant is being set up at Washim, Maharashtra. The technology has been provided by the Energy Research Centre (ECN) and M/s Dahlman of Netherlands and M/s Thermax Ltd., India are the service providers. The electricity generated will be partially used for factory requirement and partly will be evacuated to the grid.</p> <p><b>Dee Vee Power - 2 MW Biomass based Distributed Power Generation Plant, Karnataka:</b> The project intends to utilise coffee husk as major source of energy for power generation. The plant is located at the tail end of the grid. It exports the power to grid through 11kV lines. The electricity generated from this plant will be sold to the local industries at Kushalnagar Industrial Estate and the remaining power to Karnataka Power Corporation Limited.</p> <p><b>Kandra Energy: 2 MW Biomass based Distributed Power Generation Plant at Bellary, Karnataka:</b> The plant utilize the biomass residues like cotton stalk, paddy straw, rice husk, bamboo chips etc.,</p>	<p>The project supported procurement of trash bailers with technology from Netherlands. Sugarcane trash use was unique feature of this project which was not common.</p> <p>Benefits:</p> <ul style="list-style-type: none"> <li>• Extended off season operation by 60-80 day</li> <li>• Project had a payback period of 1.5 to 2 years</li> <li>• Govt. of Maharashtra issued guidelines allowing sugar mills to use cane trash in their power plants</li> </ul> <p>1 MIP [1.2 MW] under green field project completed, 1 MIP (1 MW) is under commissioning, 2 MIPs [4 MW] committed and are under various stages of commissioning and 5 [7 MW] more under consideration/progress cumulating to 13.7 MW.</p> <p><b>Ankur Scientific Energy Technology Pvt. Ltd, Sankheda, Gujarat commissioned 1.2 MW power plant based on biomass gasification.</b> This is perhaps one of the first small scale 'open access' plant [Open access - power produced is sold to a third party by wheeling the power through state grid]. The electricity was sold to Aditya Birla Insulators, [a company producing electrical components] through PPA for Rs 5.25 per kWh. Ankur was also leveraging REC benefits [Rural Electricity Certificate]. However, the unit halted operations in December 2013. PMU is examining the reasons and trying to discuss with all the concerned [Ankur, Aditya Birla and Gujrat Electricity authorities] to engage in the process of revival. One of the reasons is that the REC [Renewable Energy Certificate] prices are floored which resulting in revenue is earned being inadequate for Ankur to manage the operations.</p> <p>Benefits:</p> <ul style="list-style-type: none"> <li>• Plant was operational for a year with an average PLF of 64%.</li> <li>• First of its kind small scale Biomass Gasification project to sell power through Open Access that helped government of Gujarat form regulations for Open Access sale for Biomass Gasification technology based projects;</li> <li>• The plant contributed to Green House Gas reduction equivalent to 6350 tCO<sub>2e</sub> in 12 months;</li> <li>• Standardisation of Gasifier System Package;</li> <li>• Documentation of benchmark cost, operational and performance data required for tariff determination;</li> <li>• Generation by 100% Producer Gas Engine;</li> <li>• Developed a pyro-gasifier capable of using biomass mixtures of varying properties;</li> <li>• Developed dry gas cleaning system reducing wastewater generation significantly;</li> </ul>
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			<p>as source of energy. About 25% of the power will be exported to the grid. This will be supplied to local communities at INR 4.2/kWh (2% annual escalation). 75% of power will be sold to Karnataka Power Corporation Limited at grid feed-in tariff of INR 3.72/kWh (2% annual escalation).</p> <p>Further, 6 more projects, cumulating to 9.5 MW is in the firm pipeline Greenfield MIPs under consideration/progress are</p> <p>[i] M/s Cummins Cogeneration Pvt Ltd., Tamil Nadu – 1 MW Gasifier [under commissioning] [ii] M/s Vana Vidyut Pvt. Ltd, Tamil Nadu - 2 MW / Gasifier [under commissioning]; [iii] M/s Ram Laxman Para Boiled Rice Mill Pvt. Ltd, AP- 2 MW Combustion [achieved financial closure]; [iv] State Farms Corporation of India Limited (SFCI), Rajasthan - 1.5 MW/ Gasification [DPR completed and Bid Process Management for selection of Technology Provider is underway]; [v] M/s Apex Energetech Pvt. Ltd, Gujarat, 2 MW/ Gasification [financial closure is under process]; and [vi] M/s Global Energy Private Limited, Mizoram 2 MW/ Combustion [yet to be decided].</p>	<ul style="list-style-type: none"> <li>Effectively used waste heat for drying biomass and for obtaining chilled water needed for gas cooling-cleaning train using VAM system</li> <li>Demonstrated use of by-product biochar as substitute for P-fertilizer through experimental plantation sites and awareness camps and documentation of findings and distributing and selling bio char to farmers in neighbourhood areas;</li> <li>Developed and distributed appropriate cook stove for use of char briquette, and created awareness among local rural community for clean cooking through its use.</li> <li>Generated employment opportunities in surrounding areas for collection, processing, transportation of biomass as well as plant operation and maintenance.</li> </ul> <p><b>Ruchi Soya Industries Ltd. (RSIL):</b> 1 MW fluidized bed biomass gasification plant is being set up at Washim, Maharashtra. The technology has been provided by the Energy Research Centre (ECN) and M/s Dahlman of Netherlands and M/s Thermax Ltd., India is the service providers. The electricity generated will be partially used for factory requirement and partly will be evacuated to the grid.</p> <p><b>Dee Vee Power - 2 MW Biomass based Distributed Power Generation Plant, Karnataka:</b> The project intends to utilise coffee husk as major source of energy for power generation. The plant is located at the tail end of the grid. It exports the power to grid through 11kV lines. The electricity generated from this plant will be sold to the local industries at Kushalnagar Industrial Estate and the remaining power to Karnataka Power Corporation Limited. The progress of implementation of the project is slow but PMU is regularly following up with the Developer and the Financial Institute.</p> <p><b>Kandra Energy: 2 MW Biomass based Distributed Power Generation Plant at Bellary, Karnataka:</b> The plant utilize the biomass residues like cotton stalk, paddy straw, rice husk, bamboo chips etc., as source of energy. About 25% of the power will be exported to the grid. This will be supplied to local communities at INR 4.2/kWh (2% annual escalation). 75% of power will be sold to Karnataka Power Corporation Limited at grid feed-in tariff of INR 3.72/kWh (2% annual escalation). The progress of implementation of the project is slow but PMU is regularly follow-in up with the Developer and the Financial Institute.</p>
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					<p>Further, 5 more projects, cumulating to 7 MW is in the firm pipeline. Greenfield MIPs under consideration/progress are -</p> <ol style="list-style-type: none"><li>1. M/s Cummins Cogeneration Pvt Ltd., Tamil Nadu – 1 MW Gasifier [under commissioning];</li><li>2. Three biomass power plants (3MW + 3MW + 1MW) in three islands in Lakshadweep with Lakshadweep Authorities– (ongoing)</li><li>3. One biomass power plants - 1MW in Andaman &amp; Nicobar islands with Andaman &amp; Nicobar Authorities– (ongoing)</li></ol>
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Output- 5.2 Documentatio n of lessons and evolution of replication strategy/plan	Performance of all MIPs commissioned got monitored, evaluated and documented. The future replication strategy/plan evolved based on major learnings/findings documented from MIPS commissioned.	0	1 for each type of MIP implemented	2 Evaluation visit was made to the project site in SLS Nellore on 31/10/2013 and 01/11/2013. PMC verified and reviewed the progress of the fuel linkage system being implemented by SLS. The Evaluation Report was shared with the Project Executive Committee.	3 A field visit was made by the NPD and NPC to the project site in Ruchi Soya Industries Ltd in Washim, Maharashtra on 17 April 2015. The visit was to review the progress of the commissioning activities.  Evaluation visit was made to the project site in SLS Nellore on 31/10/2013 and 01/11/2013. PMC verified and reviewed the progress of the fuel linkage system being implemented by SLS. The Evaluation Report was shared with the Project Executive Committee.
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## Development Objectives Rating

<p><b>Project Manager / Coordinator</b> is the person managing the day to day operations of the project.</p>	<p>MANDATORY RATING MUST BE PROVIDED for projects under implementation in one country or regional projects where appropriate.</p> <p>Please review the cumulative progress toward end-of-project targets as noted in the DO tab of this PIR and provide a rating on this progress. Please consider the following questions before selecting a DO rating:</p> <ol style="list-style-type: none"> <li>1. What is the likelihood that the project will achieve its stated objective?</li> <li>2. What is the likelihood that the project will achieve all stated outcomes by the planned project closure date?</li> </ol> <p>Please justify your rating and address the following points in your comments. Please keep word count between 500 words minimum and 1200 words maximum.</p> <ol style="list-style-type: none"> <li>1. Explain why you gave a specific rating.</li> <li>2. Note trends, both positive and negative, in achievement of outcomes as per the updated indicators provided in the DO sheet.</li> <li>3. Fully explain the critical risks that have affected progress.</li> <li>4. Outline action plan to address projects with DO rating of HU, U or MU.</li> </ol> <p><b>Highly Satisfactory</b></p> <p>The project has contributed significantly in building capacities and raising awareness about the Biomass Power sector in India. It has also provided a common platform to key stakeholders for dialogue on the problems faced by the Biomass Power sector in India.</p> <p>The 1.2 MWe MIP that has been supported in Sankheda has generated considerable learning on regulatory, tariff and operational issues of running a Biomass power plant. In the reporting period, the project has sanctioned two new MIPs and the cumulative capacity of Green field installations till now is 6.2 MW. Additionally, 5 Green field projects, cumulating to 7 MW is in the firm pipeline. The cumulative capacity of MIPs supported for Fuel Supply Linkage is 37 MW.</p> <p>The continuous dialogue that has been initiated by the project through formation of the Working Group on Removal of Barriers to Scaling up of Biomass Power has resulted in successful revision of tariff for the sector, and also in most State Nodal Agencies following the tariff order. Following results that can be attributed to working recommendations</p> <ul style="list-style-type: none"> <li>• Central Electricity Regulatory Commission (CERC) revised the tariff for biomass power plants</li> <li>• CERC issued new Tariff Guidelines for Gasifiers.</li> <li>• 'Performance/ Viability of biomass based plants operating in India, including prevailing prices'.</li> </ul>
<p><b>UNDP Country Office Programme Officer</b> is the UNDP programme officer in the UNDP country office who provides oversight and supervision support to the project.</p>	<p>MANDATORY RATING MUST BE PROVIDED for projects under implementation in one country. Not necessary for regional or global projects.</p> <p>Please review the cumulative progress toward end-of-project targets as noted in the DO tab of this PIR and provide a rating on this progress. Please consider the following questions before selecting a DO rating:</p> <ol style="list-style-type: none"> <li>1. What is the likelihood that the project will achieve its stated objective?</li> <li>2. What is the likelihood that the project will achieve all stated outcomes by the planned project closure date?</li> </ol> <p>Please justify your rating and address the following points in your comments. Please keep word count between 500 words minimum and 1200 words maximum.</p>

1. Explain why you gave a specific rating, for example, if your rating differs from the rating provided by the project manager please explain why.
2. Note trends, both positive and negative, in achievement of outcomes as per the updated indicators provided in the DO sheet.
3. Fully explain the critical risks that have affected progress.
4. Outline action plan to address projects with DO rating of HU, U or MU.

**Moderately Satisfactory (MS)**

The outcomes/outputs as per revised LFA and progress made are provided below.

Outcome 1. Technology package benchmarking & validation for different biomass power technologies including feasibility of energy plantation. The expected outputs are, (i) potential of biomass hybrid (solar thermal, biogas, etc.) technology for power generation in India explored, documented and shared with MNRE, (ii) Technology performance and evaluation of benchmarks for MIP available, (iii) Long term perspective plan for utilization of wasteland and biomass resources for power generation, (iv) Socio economic study for assessment of impact of biomass power plant on employment generation, livelihood improvement and environment. Following are achieved.

- Commissioned assignment to study the status of biomass-solar hybrid, feasibility and generating expression of interest. The report is yet to be finalized. There were no Eols received from developers.
- Technology performance and evaluation of benchmarks for MIPs are available separately, but they are yet to be compiled.
- Detailed analysis of utilization of wasteland, energy plantation and biomass resource for power generation was prepared and the developers are initiating action based on these reports.
- Socio economic study has been commissioned recently.

Outcome 2. Enhanced capacities and confidence of project promoters, financial institutions, regulators, policy makers, SNAs, other stakeholders through effective information development & dissemination program, along with capacity building initiatives. Following are the expected outputs, [i] increased information available with project promoters and all stakeholders in the focused states and their enhanced knowledge base, [ii] improved capacity of key stakeholders and project promoters in the targeted states. Following is the progress;

- Working group at MNRE was set up to analyse the challenges facing biomass power sector and identify set of actions to overcome them. As a result of this, FIT was revised by Central Electricity Regulator Commission from earlier Rs 5 to 7 plus per kWh. Some state governments have implemented the CERC guidelines.
- Two workshops were conducted with state regulators. These workshops helped sensitizing regulators on opportunities for biomass power and challenges faced in its promotion. One of the key results was consideration of differential tariff for small scale biomass power systems. Till now, biomass power tariff is set up based on information, data from large scale biomass power plants. Such a setting does not help small scale biomass power of capacity less than 5 MW.

Outcome 3. Development of business, commercial and support services networks in focused states. The expected outputs are, information sharing and networking of biomass power practitioners at the regional/ state level strengthened.

- Published 13 issues of Bioenergy and Biopower quarterly newsletters. In 8 years of project existence, 32 issues could have been published, but this opportunity was lost.
- Biomass portal was developed with URL <http://viainfotech.biz/Biomass/theme5/library-forms.php> and launched in May 2015. This is expected to serve as one stop information on biomass power. This could have been established much earlier during the project.

Outcome 4. Creation of fund for contingent financing.

A study conducted by E & Y as part of project in 2012 revealed that 18 - 20 banks were willing to provide term loans to the projects. Hence, the revised LFA proposed to discontinue Contingent Funding, which was approved by Project Steering Committee.

Outcome 5. Model Investment Projects (MIPs). The expected outputs are, [i] commissioning and stabilization of MIPs Implementation of green-field MIPs, [ii] documentation of lessons and evolution of replication strategy/ plan.

The project has a total target of 30 MW, all greenfield projects in the original ProDoc. However, subsequently, realizing the support required for even existing projects they were included. Revised LFA limited the role of existing projects to 18 MW and balance 12 MW must be greenfield projects.

**37 MW of existing projects were supported for fuel linkage and other support aimed at increasing the PLF. These projects are,**

**Universal Biomass Energy Pvt. Ltd, Muktsar, Punjab, 14.5 MW:** Set up additional 18 decentralized biomass depots (DBD) in a radius of 100 km to collect biomass, resulted in reduced landed fuel cost by USD 4.2 to 4.5 per ton. Boiler modifications were carried out to handle paddy straw bales, avoiding chipping of paddy straw. Plant has generated employment opportunities for 1000 local people in biomass supply and processing.

**SLS Power Ltd., Nellore, Andhra Pradesh, 6 MW:** Set up 4 DBDs in radius of 50 km to collect various residues, namely cotton stalk, paddy straw, sugar cane trash, etc. to replace rice husks, currently used as main fuel. DBDs have helped reduce landed fuel cost by USD 5 to 6 per ton. Plant generated employment for about 900 people in biomass supply and processing.

**MPPL - Muktsar – Biomass Combustion, 7.5 MW:** Set up a storage shed, harvesting cum chipping device, material handling equipment, cargo canters to transport biomass from fields through weigh bridges to collection centers. These facilities helped reducing biomass losses by 5-10%. The biomass supply and conversion has created local employment, increased income to farmers. It is estimated that 2 to 3% PLF has increased, and reduced landed cost of fuel by USD 2.5 to 3 per ton. Based on this experience, Government of Punjab has issued guidelines for subsidy to farmers on purchase of fuel collection equipment's.

**Panduranga Sugar - Solapur - Cogeneration, 9 MW:** Set up unique feature of bailing trash using trash bailers procured from Netherlands. This has helped the unit to extend the operational days by 60 to 80 days and payback period on additional investment was 1.5 to 2 years. Government of Maharashtra issued guidelines allowing sugar mills to use cane trash in their power plants.

Against target of 12 MW green field projects, following is the progress;

**Ankur Scientific Energy Technology Pvt. Ltd, Sankheda, Gujarat commissioned 1.2 MW power plant based on biomass gasification:** One of the first small scale 'open access' plant [Open access - power produced is sold to a third party by wheeling the power through state grid]. Ankur sold power to Aditya Birla Insulators. The revenue for Ankur included Rs 5.25 per kWh from Aditya and REC benefits [Rural Electricity Certificate]. Plant was operational for a year with an average PLF of 64% and GHG gases reduced was 6350 tCO<sub>2</sub>e. The operation provided operational and performance data and experience of running 100% producer gas engine, resulting in standardization of Gasifier System Package, documentation of benchmark cost, tariff determination.

In addition, it helped to come out with innovations. They include, development of a pyro-gasifier capable of using biomass mixtures of varying properties, development of dry gas cleaning system reducing wastewater generation significantly, effectively use waste heat for drying biomass and for obtaining chilled water needed for gas cooling-cleaning train using VAM (Vapour Absorption Machine) system, demonstrated use of by-product biochar as substitute for Phosphorous-fertilizer through

experimental plantation sites and awareness camps and documented findings, distributed and sold bio-char to farmers, developed and distributed appropriate cook stove for use of char briquette and created awareness among local rural community for clean cooking through its use and generated employment opportunities in surrounding areas for collection, processing, transportation of biomass as well as plant operation and maintenance.

After successful operation for about one year plus, the unit halted operations in December 2013 as it was no more remunerative, as production costs were higher than the revenues received. There were issues relating to wheeling in addition. PMU is examining the reasons and trying to discuss with all the concerned Ankur, Aditya Birla and Gujrat Electricity authorities to engage in the process of revival.

**Ruchi Soya Industries Ltd. (RSIL):** 1 MW fluidized bed biomass gasification plant is being set up at Washim, Maharashtra. Energy Research Centre (ECN) and M/s Dahlman of Netherlands provided technology, while Thermax Ltd., India are the service providers. The electricity generated will be partially used for factory requirement and partly will be evacuated to the grid. This has time overrun of 2 years, PMU must make all efforts to get it commissioned at the earliest and generate information to draw lessons for future action.

**Cummins Cogeneration Pvt Ltd., Tamil Nadu – 1 MW Gasifier:** This is under commissioning.

**Dee Vee Power - 2 MW Biomass based Distributed Power Generation Plant, Karnataka:** The project intends to utilise coffee husk as major biomass source to produce power generation. The electricity generated will be sold to local industries at Kushalnagar Industrial Estate and the remaining power to Karnataka Power Corporation Limited through 11 kV line.

**Kandra Energy: 2 MW Biomass based Distributed Power Generation Plant at Bellary, Karnataka:** The project intends to use biomass residues like cotton stalk, paddy straw, rice husk, bamboo chips etc. 25% power will be sold to local communities at INR 4.2/kWh with 2% annual escalation and the rest to Karnataka Power Corporation Limited at grid at feed-in tariff of INR 3.72/kWh with 2% annual escalation.

Comfort letters were provided by PMU in 2010 to these projects; however the financial closure has not happened. A reason for these two plants not coming up is low feed in tariff offered by Government of Karnataka. PMU however, need not pursue much with this plant as it is not likely to come up by current EOP (end of project), 31 March 2016, however, PMU must work with GOK to increase tariff as it would benefit upcoming biomass power plants.

Further, four more projects, cumulating to 8 MW is in pipeline, namely  
Three biomass power plants (3MW + 3MW + 1MW) in three islands in Lakshadweep with Lakshadweep Authorities– (ongoing)  
One biomass power plants - 1MW in Andaman & Nicobar islands with Andaman & Nicobar Authorities– (ongoing)

The project has contributed in working with CERC in revising the Feed in Tariff and successful in revision of tariff. Now PMU need to work with SERCs to implement them for benefiting biomass developers. The project also demonstrated usefulness in supporting fuel linkages to existing projects that has presumably contributed to increasing PLF. Though the project support to existing project could not establish its correlation to PLF increase, it presumably helped the units the importance of depots, bailing machines, boiler corrections etc. and more importantly, concerned government such as Government of Punjab provided subsidy support to farmers to purchase machines supporting fuel linkages. This in short run motivates farmers to purchase such machines, and in long run these machines will be part of overall project.

The Feed in tariff offered while is manageable for large scale biomass power plants, it does not seem to be sufficient for small scale power plants of capacities less than 5 MW. Further some of the states have not revised FITs aligning with revised FIT guidance of CERC. However, PMU has given comfort

	<p>letters to some projects in such situation where starting plant is not remunerative them. On the other hand, running of small power plants will provide the PMU with data, information that can help set new or revised guidelines for small scale power plants. Accordingly, brainstorming was done between PMU, UNDP and the consultant carrying out revision of LFA regarding introducing Generation Based Incentive for a few projects. A rate of 1 to 2 Rs per kWh was proposed. The proposal has not been implemented by the PMU for more than a year now, thereby losing bit of time which has an impact on project progress both in terms of physical and financial.</p> <p>The project was originally designed for 3 years with an outlay of 5.65 million GEF grants. The project has now completed almost 8 years since its start in 2007 and the expenditure is only 50%. The third extension ends as on March 2016, however, project has not yet planned expenditure. Despite these opportunities lost, the PMU contributed to revision of tariff through setting up working group. It is engaged with state governments to revise tariffs. Some unique interventions made in MIPs in existing and greenfield where significant lessons learnt.</p> <p>Following the above description of progress, I provide a rating of Moderately Satisfactory. In order to make adequate physical and financial progress and turn the project towards satisfactory level, PMU needs to follow up on activities.</p> <ol style="list-style-type: none"> <li>1. PMU is yet to take up many studies, other soft activities such as compendium of benchmarks etc, which needs to be immediately implemented</li> <li>2. PMU has got many studies carried out during the course of project, perhaps over 20 in number. Many of them are very valuable to biomass power stakeholders, academicians, analysts. PMU to get them uploaded on website.</li> <li>3. It is also advised that the PMU implements the Generation Based Incentive at the earliest so that many small scale projects can benefit, and provide much needed information and lessons for developing roadmap for small scale power plants.</li> <li>4. The data of MIPs must be monitored more closely, and uploaded for the benefit of stakeholders for analysis and benefit. It need not contain name of the units but the data must be made available.</li> <li>5. It is suggested that the PMU can take the UNDP country office support modality to expedite the project progress.</li> </ol>
<p><b>GEF Operational Focal point</b> is the government representative in the country designed as the GEF operation focal point.</p>	<p>HIGHLY RECOMMENDED but NOT mandatory for projects under implementation in one country. Not necessary for regional or global projects.</p> <p>Please review the cumulative progress toward end-of-project targets as noted in the DO tab of this PIR and provide a rating on this progress. Please consider the following questions before selecting a DO rating:</p> <ol style="list-style-type: none"> <li>1. What is the likelihood that the project will achieve its stated objective?</li> <li>2. What is the likelihood that the project will achieve all stated outcomes by the planned project closure date?</li> </ol> <p>Please justify your rating and address the following points in your comments. Please keep word count between 200 words minimum and 500 words maximum.</p> <ol style="list-style-type: none"> <li>1. Explain why you gave a specific rating.</li> <li>2. Note trends, both positive and negative, in achievement of outcomes as per the updated indicators provided in the DO sheet.</li> <li>3. Provide recommendations for next steps.</li> </ol> <p>[DO rating in 2015]</p>



	[comments]
<p><b>Project Implementing Partner</b> is the representative of the executing agency (in GEF terminology). This would be Government (for NEX/NIM execution) or NGO (for CSO Execution) or an official from the Executing Agency (for example UNOPS).</p>	<p>RECOMMENDED but NOT MANDATORY for projects under implementation in one country and regional projects.</p> <p>Please review the cumulative progress toward end-of-project targets as noted in the DO tab of this PIR and provide a rating on this progress. Please consider the following questions before selecting a DO rating:</p> <ol style="list-style-type: none"> <li>1. What is the likelihood that the project will achieve its stated objective?</li> <li>2. What is the likelihood that the project will achieve all stated outcomes by the planned project closure date?</li> </ol> <p>Please justify your rating and address the following points in your comments. Please keep word count between 200 words minimum and 500 words maximum.</p> <ol style="list-style-type: none"> <li>1. Explain why you gave a specific rating.</li> <li>2. Note trends, both positive and negative, in achievement of outcomes as per the updated indicators provided in the DO sheet.</li> <li>3. Provide recommendations for next steps.</li> </ol>
	[DO rating in 2015]
	[comments]
<p><b>Other Partners:</b> For jointly implemented projects, a representative of the other Agency working with UNDP on project implementation (for example UNEP or the World Bank).</p>	<p>RECOMMENDED but NOT MANDATORY for jointly implemented projects.</p> <p>Please review the cumulative progress toward end-of-project targets as noted in the DO tab of this PIR and provide a rating on this progress. Please consider the following questions before selecting a DO rating:</p> <ol style="list-style-type: none"> <li>1. What is the likelihood that the project will achieve its stated objective?</li> <li>2. What is the likelihood that the project will achieve all stated outcomes by the planned project closure date?</li> </ol> <p>Please justify your rating and address the following points in your comments. Please keep word count between 200 words minimum and 500 words maximum.</p> <ol style="list-style-type: none"> <li>1. Explain why you gave a specific rating.</li> <li>2. Note trends, both positive and negative, in achievement of outcomes as per the updated indicators provided in the DO sheet.</li> <li>3. Provide recommendations for next steps.</li> </ol>
	[DO rating in 2015]
	[comments]
	MANDATORY RATING MUST BE PROVIDED for all projects.

<p><b>UNDP Technical Adviser</b> is the UNDP-GEF Technical Adviser.</p>	<p>Please review the cumulative progress toward end-of-project targets as noted in the DO tab of this PIR and provide a rating on this progress. Please consider the following questions before selecting a DO rating:</p> <ol style="list-style-type: none"> <li>1. What is the likelihood that the project will achieve its stated objective?</li> <li>2. What is the likelihood that the project will achieve all stated outcomes by the planned project closure date?</li> </ol> <p>Please justify your rating and address the following points in your comments. Please keep word count between 500 words minimum and 1200 words maximum.</p> <ol style="list-style-type: none"> <li>1. Explain why you gave a specific rating (do not repeat the project objective).</li> <li>2. Note trends, both positive and negative, in achievement of outcomes as per the updated indicators provided in the DO sheet.</li> <li>3. Fully explain the critical risks that have affected progress.</li> <li>4. Outline action plan to address projects with DO rating of HU, U or MU.</li> </ol>
	<p><b>Moderately Satisfactory (MS)</b></p> <p>Project is expected to achieve most of its major relevant objectives but with either significant shortcomings or modest overall relevance. And also the project is expected not to achieve some of its major global environmental objectives or yield some of the expected global environment benefits. The project must be completed by March 2016. Terminal evaluation of the project must be initiated sometime in November/December 2015.</p> <p>It is very much recognised that biomass power projects in India are still faced with many challenges such as, lack of secured fuel supply and under payments received per unit of electricity supplied to grid when compared with electricity generation cost. Therefore, providing Generation Based Incentives (GBI) was approved in a 2014 PSC meeting in order to build confidence among project developers, but it was never implemented.</p> <p>Despite of these issues, the project has showcased some good progress in <b>promoting technologies such as combustion, gasification and cogeneration</b> for producing electrical and thermal energy using <b>sustained fuel supply linkage</b> of different types of biomass resources.</p> <p>The project has demonstrated the importance of <b>sustained fuel supply linkage</b> at four biomass power plants.</p> <ol style="list-style-type: none"> <li>(1) <u>Universal Biomass Energy Pvt. Ltd, Muktsar, Punjab, 14.5 MW</u>: the project supported the modifications to the boiler to handle paddy straw bales. This has avoided chipping and handling heaps of chipped paddy straw that resulted in ease of operation and cost reduction. Additional 18 decentralized biomass depots (DBD) were set up in a radius of 100 km to collect biomass, and resulted in reduced fuel cost at the plant by US\$ 4.2 - 4.5 per tonne. The power plant has generated employment opportunities for about 1,000 people from the local community in biomass supply and processing in addition to about 200 people employed directly for the plant operation.</li> <li>(2) <u>SLS Power Ltd., Nellore, Andhra Pradesh, 6 MW</u>: The project supported the establishment of 4 DBD within a radius of 50 km to collect agricultural residues such as cotton stalk, paddy straw, sugar cane trash, etc. to replace rice husks which was used as a main fuel. This has helped the power plant to reduce fuel cost at the plant by US\$ 5 – 6 per tonne. The power plant has generated employment opportunities for about 900 people from the local community in biomass supply and processing.</li> </ol>

- (3) **Malwa Power (P) Limited (MPPL), Muktsar, Punjab, 7.5 MW:** The project supported to set up storage shed, harvesting cum chipping device, material handling equipment, cargo canters to transport biomass from fields and weigh bridges at collection centers. The decentralized biomass collection centers are 5 km apart and in few cases mobile chipping machines were set up to facilitate higher quantities of biomass procurement at economical prices. This has enhanced the collection efficiency by 10% and avoided transportation of low density material
- (4) over long distances. It was estimated that all these facilities helped reducing biomass losses by 5-10% and increased Plant Load Factor (PLF) by 2 to 3%. The cost of fuel supply was reduced by US\$ 2.5 to 3 per tonne of biomass at the plant. On an average, MPPL fuel supply linkage model provided an employment for 400 people per collection center including farmers, workers, dry leaf collection families, and transporters. Twenty-five biomass collection centres were established, where this model provided employment for about 10,000 persons over a 6 months period in a year. Among those employed, about 40% are women. In addition, about 190-200 persons are employed at the power plant for the plant operation. This has resulted in the creation of indirect benefits associated with biomass power that can't be ignored. Based on this experience, Government of Punjab has issued guidelines for subsidy to farmers on purchase of fuel collection and processing equipment.
- (5) **Panduranga Sugar, Solapur, Maharashtra, 15 MW:** The project supported to set up sugarcane trash bailers and use the trash for cogeneration purposes. This has helped the sugar mill to extend the operational days by 60 to 80 days and payback period on additional investment was 1.5 to 2 years. Following the project results, Government of Maharashtra issued guidelines allowing sugar mills to use cane trash in their power plants.

With the influence of clean development mechanism (CDM), biomass power plants mushroomed all over few states in India. Fuel supply assessments were flawed. This resulted in a situation where biomass availability is constrained and cost of biomass increased. Then developers and the ministry realized the race between the increased costs of inputs mainly the biomass, reduced viability, and approached Central Electricity Regulatory Commission (CERC) for revising the FIT. The FIT now stands revised at INR 6 to 7.5 per kWh. Historically, in India, implementation of power projects including biomass power projects requires a number (at least eight) of clearances for grid connection, land approvals, pollution control clearances and many more and require about 15 to 30 months to get necessary approvals.

**The project also helped to overcome some of the challenges being faced by biomass gasification technology:** Although gasification technology is proven in India, it is facing challenge in terms of continued operation at large scale. In order to overcome this technical challenge, the Biomass Power project supported demonstration of 1.2 MW gasification based power plant, which was implemented by Ankur Scientific Energy Technology Pvt. Ltd, at Sankheda, Gujarat. This company is one of the gasifier technology suppliers in India. Following the 1.2 MW gasifier demonstration project at Sankheda, they have made a major changes to the basic design of gasifiers to accommodate various biomass fuel types.

It is important that the project will at least consolidate knowledge products, reports, and products that were developed under the project over a decade.

Although the project demonstrated adaptive management to the level expected, the progress is quite slow. The overall DO rating of the project can be rated Moderately Satisfactory (MS).

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**General comments on Development Objective Rating**

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<b>DO Progress: Rating Definitions</b>	
Highly Satisfactory (HS)	Project is expected to achieve or exceed all its major global environmental objectives and yield substantial global environmental benefits without major shortcomings. The project can be presented as “good practice”.
Satisfactory (S)	Project is expected to achieve most of its major global environmental objectives and yield satisfactory global environmental benefits with only minor shortcomings.
Moderately Satisfactory (MS)	Project is expected to achieve most of its major relevant objectives but with either significant shortcomings or modest overall relevance. Project is expected not to achieve some of its major global environmental objectives or yield some of the expected global environment benefits.
Moderately Unsatisfactory (MU)	Project is expected to achieve its major global environmental objectives with major shortcomings or is expected to achieve only some of its major global environmental objectives.
Unsatisfactory (U)	Project is expected not to achieve most of its major global environment objectives or to yield any satisfactory global environmental benefits.
Highly Unsatisfactory (HU)	The project has failed to achieve, and is not expected to achieve, any of its major global environment objectives with no worthwhile benefits.



## Implementation Progress

For each project Outcome briefly describe up to four (4) major outputs delivered this reporting period only (i.e. annual progress not cumulative progress). **Do not repeat outputs reported in previous PIRs.** If you have any general comments about the information in this section of the PIR, please note them at the bottom of this page.

Outcome	Outputs reported as of 30 June 2015
<b>Outcome 1</b>	Technology package benchmarking and validation for different biomass power technologies, including feasibility of energy plantation.
	<ol style="list-style-type: none"> <li>1. A Techno-economic feasibility of biomass-solar hybrid along with development of Detailed Project Report for implementing one biomass-solar hybrid based power project has been initiated and the draft Global Status Report has been received;</li> <li>2. The State wise report on Identification of wastelands, review of existing policy and regulatory frameworks and prospective plan was prepared for Odisha, Bihar, and Rajasthan and shared with the State Nodal Agencies.</li> </ol>
<b>Outcome 2</b>	Enhanced Capacities and confidence of Project Promoters, Financial Institutions, Regulators, Policy Makers, SNAs, other stakeholders through effective information development & dissemination program, along with capacity building initiatives
	<ol style="list-style-type: none"> <li>1. 3 issues of 'BioPower' were published, circulated to about 700 stakeholders and uploaded on UNDP website and most of them circulated on UN Solution Exchange.</li> <li>2. A paper titled "Overview of the Indian Biomass Power sector – Challenges &amp; Trends" presented at the International Renewable Energy Congress held in Sousse, Tunisia during 24-26 March 2015. NPD, NPC participated in the conference.</li> <li>3. A web based Knowledge Portal – <a href="http://www.biomasspower.gov.in">www.biomasspower.gov.in</a> has been developed. The knowledge portal will be a user-friendly single point source for information/data related to generation of power – grid interactive as well as off – grid and captive applications; and thermal energy from biomass. The Web Portal was formally launched by Mr. Piyush Goyal, Hon'ble Minister (IC) of State for Power, Coal and New &amp; Renewable Energy on 14 May 2015. The web portal is currently accessible through the MNRE website.</li> </ol>
<b>Outcome 3</b>	Development of business, commercial and support services networks in focused States
	No activity undertaken.
<b>Outcome 4</b>	Creation of fund for contingent financing
	<ol style="list-style-type: none"> <li>1. As per the revised LFA, the Contingent Funding has been discontinued to report the progress here from this reporting period.</li> </ol>
<b>Outcome 5</b>	Model Investment Projects (MIPs)
	<ol style="list-style-type: none"> <li>1. A field visit was made by the NPD and NPC to the project site in Ruchi Soya Industries Ltd in Washim, Maharashtra on 17 April 2015. The visit was to review the progress of the commissioning activities.</li> </ol>

### General comments on Implementation Progress

## Implementation Progress Rating

<p><b>Project Manager / Coordinator</b> is the person managing the day to day operations of the project.</p>	<p>MANDATORY RATING MUST BE PROVIDED for projects under implementation in one country or regional projects where appropriate.</p> <ol style="list-style-type: none"> <li>1. Please rate the progress in delivery of outputs. For example, do the annual outputs represent sufficient progress in order to achieve the project outcomes (see DO page of this PIR)? [HS / S / MS / MU / U / HU / n.a]</li> <li>2. Please rate the efficiency in delivery of outputs. For example, in this reporting period are budget resources being spent as planned? (i.e. is project delivery on target?) [HS / S / MS / MU / U / HU / n.a]</li> <li>3. Please rate the quality of risk management. For example, in this reporting period were project risks managed effectively? [HS / S / MS / MU / U / HU / n.a]</li> <li>4. Please rate the quality of adaptive management. For example, in this reporting period were actions taken to address implementation issue identified in the PIR last year? [HS / S / MS / MU / U / HU / n.a]</li> <li>5. Please rate the quality of monitoring and evaluation. For example, in this reporting period were sufficient financial resources allocated to project monitoring and evaluation. [HS / S / MS / MU / U / HU / n.a]</li> </ol> <p>Please justify your rating and address the following points in your comments. Please keep word count between 500 words minimum and 1200 words maximum.</p> <ol style="list-style-type: none"> <li>1. Explain why you gave a specific rating.</li> <li>2. Summarize annual progress and address timelines of project output/activity completion in relation to annual workplans.</li> <li>3. Outline the general status of project expenditures in relation to annual budgets, the effectiveness of project management units in guiding project implementation, and the responsiveness of the project board in overseeing project implementation.</li> </ol>
	<p><b>Highly Satisfactory</b></p> <p>The 1.2 MWe MIP that has been supported in Sankheda has generated considerable learning on regulatory, tariff and operational issues of running a Biomass power plant. In the reporting period, the project has sanctioned two new MIPs and the cumulative capacity of Green field installations till now is 6.2 MW. Additionally, 5 Green field projects, cumulating to 7 MW is in the firm pipeline. The cumulative capacity of MIPs supported for Fuel Supply Linkage is 37 MW.</p> <p>The continuous dialogue that has been initiated by the project through formation of the Working Group on Removal of Barriers to Scaling up of Biomass Power has resulted in successful revision of tariff for the sector, and also in most State Nodal Agencies following the tariff order.</p> <p>The project has also launched the first of it's kind interactive knowledge portal for the biomass sector in the country. The portal will serve as a single point for all the relevant knowledge and information on the biomass sector in India. The quarterly magazine, BioPower India has been very well received by all the stakeholders.</p> <p>A study on the Socio-Economic and Environment Impact of Biomass Power plants on the local rural economy has been initiated. Considering that biomass is a promising source for generation of power and has the potential to provide large productive employment in rural areas, the outcome of the study may be useful in securing term loan from Banks and other Financial Institutions. This would provide an impetus to the sector through timely and adequate credit.</p>
<p><b>UNDP Country Office Programme</b></p>	<p>MANDATORY RATING MUST BE PROVIDED for projects under implementation in one country. Not necessary for regional or global projects.</p>

<p><b>Officer</b> is the UNDP programme officer in the UNDP country office who provides oversight and supervision support to the project.</p>	<ol style="list-style-type: none"> <li>1. Please rate the progress in delivery of outputs. For example, do the annual outputs represent sufficient progress in order to achieve the project outcomes (see DO page of this PIR)? [HS / S / MS / MU / U / HU / n.a]</li> <li>2. Please rate the efficiency in delivery of outputs. For example, in this reporting period are budget resources being spent as planned? (i.e. is project delivery on target?) [HS / S / MS / MU / U / HU / n.a]</li> <li>3. Please rate the quality of risk management. For example, in this reporting period were project risks managed effectively? [HS / S / MS / MU / U / HU / n.a]</li> <li>4. Please rate the quality of adaptive management. For example, in this reporting period were actions taken to address implementation issue identified in the PIR last year? [HS / S / MS / MU / U / HU / n.a]</li> <li>5. Please rate the quality of monitoring and evaluation. For example, in this reporting period were sufficient financial resources allocated to project monitoring and evaluation. [HS / S / MS / MU / U / HU / n.a]</li> </ol> <p>Please justify your rating and address the following points in your comments. The QORs and delivery data in the ERBM portfolio project monitoring report should inform your rating. Please keep word count between 500 words minimum and 1200 words maximum.</p> <ol style="list-style-type: none"> <li>1. Explain why you gave a specific rating. If your rating differs from the rating provided by the project manager please explain why.</li> <li>2. Summarize annual progress and address timeliness of project output/activity completion in relation to annual workplans.</li> <li>3. Outline the general status of project expenditures in relation to annual budgets, the effectiveness of project management units in guiding project implementation, and the responsiveness of the project board in overseeing project implementation.</li> </ol>
	<p><b>Moderately Unsatisfactory (MU)</b></p>
	<p><b>Outcome 1. Technology package benchmarking &amp; validation for different biomass power technologies including feasibility of energy plantation.</b> Against this outcome, PMU formulated the following activities namely, [i] study biomass-solar hybrid for power generation in India and abroad and prepare a techno-economic feasibility report, [ii] DPRs for biomass-solar hybrid for power generation, [iii] exposure visit for PMU, selected experts and potential investors abroad, [iv] techno-commercial viability of wastelands for biomass production for power generation. The progress is as follows;</p> <ul style="list-style-type: none"> <li>• Commissioned study on Biomass-solar hybrid to consulting firms STEAG and Medhaj, the report is yet to be finalized.</li> <li>• No response received to the Expression of interest sought for biomass-solar hybrid.</li> <li>• Participated in European Biomass Conference at Hamburg in Germany. A team of four members, one potential public sector representative from State Finance Corporation of India [SFCI], National Project Coordinator and National Project Manager of PMC, UNDP Programme Analyst participated. Key learning was [i] biomass power sector is under turmoil even in Europe/ other parts of Asia similar to the situation in India, [ii] very few case studies exist on biomass gasifier plants for power generation.</li> <li>• Finalised reports by DESL on utilization of wasteland, energy plantation and biomass resource for power generation. The developers are initiating action based on these report</li> </ul> <p><b>Outcome 2. Enhanced capacities and confidence of project promoters, financial institutions, regulators, policy makers, SNAs, other stakeholders through effective information development &amp; dissemination program, along with capacity building initiatives.</b> Following activities were formulated namely, [i] publication of 'Biopower India', [ii] technical editing of two reports and upload them on website, [iii] socio-economic impact assessment of biomass power plants, [iii] launch of biomass knowledge portal.</p>

	<ul style="list-style-type: none"> <li>• Published one issue of 'Biopower India' against four that should have been done in the reporting period.</li> <li>• The reports planned to be edited are yet to be uploaded on website.</li> <li>• Commissioned socio-economic study in May 2015.</li> <li>• Launched Biomass knowledge portal in May 2015.</li> </ul> <p><b>Outcome 3. Development of business, commercial and support services networks in focused states: two regional workshops for sharing information, knowledge and experience on biomass power and recommend actions for conducive policy and regulatory atmosphere to exploit biomass power in India.</b></p> <p>Bank loan limits increased to Rs 15 Crore to borrowers for biomass based and other RE power generators, and for non-conventional energy based public utilities have been brought under the Priority Sector Lending by RBI. This was possible perhaps due to efforts of Working Group set up under the project.</p> <p>Leveraged a funding of INR 200 Crore from 'National Clean development Fund' to make non-functional plants functional by MNRE. PMU has proposed to put the balance fund available in UNDP-GEF project into this pool of funding. However, UNDP has sought more information from PMU on how the UNDP-GEF money shall contribute to incremental activities and meet the GEF objectives.</p> <p><b>Outcome 4. Creation of fund for contingent financing.</b> This outcome was dropped.</p> <p><b>Outcome 5. Model Investment Projects (MIPs).</b> The activities included, [i]completing implementation in 3 to 4 MIPs, [ii] providing Generation Based Incentive to two MIPs cumulating to 3 MW, [iii] monitoring and evaluation of MIPs. he expected outputs are, [i] commissioning and stabilization of MIPs Implementation of green-field MIPs, [ii] documentation of lessons and evolution of replication strategy/ plan.</p> <ul style="list-style-type: none"> <li>• Final assessment of two MIPs completed and payments released for (i) Fuel Supply Linkage at SLS, Nellore and (ii) Fuel Supply Linkage at Universal Biomass, Muktsar, Punjab. Technical assistance was provided to TATA Power and SFCI to develop biomass power plants, but these two agencies did not provide firm commitments. However, there has been some progress with reference to Ruchi Soya MIP though it is lagging by over 2 years in timeline.</li> <li>• GBI was not taken up.</li> <li>• Completed monitoring and evaluation for 3 plants.</li> <li>• No documentation of lessons has been carried out and no replication strategy prepared.</li> </ul> <p>The prorata target for 1 July 2014 to 30 June 2015 is about 800,000 USD and the expenditure is just 222,933 USD, i.e. just 28%. The AWP 2014 and 2015 were not ambitious given the set of challenges in the sector, balance set of physical and financial obligations towards the project. Further, the progress has been slow both in physical and financial terms. Studies like biomass-solar hybrid status, feasibility, etc. which are well within the control of PMU have not been concluded even after one to one &amp; half years. There was enormous delay in commissioning socio-economic impact assessment study.</p> <p>The project had enormous opportunities during the reporting period to commission and complete studies, pilot GBI and document lessons. But it looks like lost opportunity. Given the above background, I provide Marginally Unsatisfactory rating to the project for the reporting period.</p>
<p><b>GEF Operational Focal point</b> is the</p>	<p>HIGHLY RECOMMENDED but NOT mandatory for projects under implementation in one country. Not necessary for regional or global projects.</p>



<p>government representative in the country designed as the GEF operation focal point.</p>	<ol style="list-style-type: none"> <li>1. Please rate the progress in delivery of outputs. For example, do the annual outputs represent sufficient progress in order to achieve the project outcomes (see DO page of this PIR)? [HS / S / MS / MU / U / HU / n.a]</li> <li>2. Please rate the efficiency in delivery of outputs. For example, in this reporting period are budget resources being spent as planned? (i.e. is project delivery on target?) [HS / S / MS / MU / U / HU / n.a]</li> <li>3. Please rate the quality of risk management. For example, in this reporting period were project risks managed effectively? [HS / S / MS / MU / U / HU / n.a]</li> <li>4. Please rate the quality of adaptive management. For example, in this reporting period were actions taken to address implementation issue identified in the PIR last year? [HS / S / MS / MU / U / HU / n.a]</li> <li>5. Please rate the quality of monitoring and evaluation. For example, in this reporting period were sufficient financial resources allocated to project monitoring and evaluation. [HS / S / MS / MU / U / HU / n.a]</li> </ol> <p>Please justify your rating and address the following points in your comments. Please keep word count between 200 words minimum and 500 words maximum.</p> <ol style="list-style-type: none"> <li>1. Explain why you gave a specific rating.</li> <li>2. Note trends, both positive and negative.</li> <li>3. Provide recommendations for next steps.</li> </ol>
	<p>[IP rating in 2015]</p>
	<p>[comments]</p>
<p><b>Project Implementing Partner</b> is the representative of the executing agency (in GEF terminology). This would be Government (for NEX/NIM execution) or NGO (for CSO Execution) or an official from the Executing Agency (for example UNOPS).</p>	<p>RECOMMENDED but NOT mandatory for projects under implementation in one country or regional projects.</p> <ol style="list-style-type: none"> <li>1. Please rate the progress in delivery of outputs. For example, do the annual outputs represent sufficient progress in order to achieve the project outcomes (see DO page of this PIR)? [HS / S / MS / MU / U / HU / n.a]</li> <li>2. Please rate the efficiency in delivery of outputs. For example, in this reporting period are budget resources being spent as planned? (i.e. is project delivery on target?) [HS / S / MS / MU / U / HU / n.a]</li> <li>3. Please rate the quality of risk management. For example, in this reporting period were project risks managed effectively? [HS / S / MS / MU / U / HU / n.a]</li> <li>4. Please rate the quality of adaptive management. For example, in this reporting period were actions taken to address implementation issue identified in the PIR last year? [HS / S / MS / MU / U / HU / n.a]</li> <li>5. Please rate the quality of monitoring and evaluation. For example, in this reporting period were sufficient financial resources allocated to project monitoring and evaluation. [HS / S / MS / MU / U / HU / n.a]</li> </ol> <p>Please justify your rating and address the following points in your comments. Please keep word count between 200 words minimum and 500 words maximum.</p> <ol style="list-style-type: none"> <li>1. Explain why you gave a specific rating.</li> <li>2. Note trends, both positive and negative.</li> <li>3. Provide recommendations for next steps.</li> </ol>
	<p>[IP rating in 2015]</p>
	<p>[comments]</p>
<p><b>Other Partners:</b> For jointly</p>	<p>RECOMMENDED but NOT mandatory for jointly implemented projects.</p>

<p>implemented projects, a representative of the other Agency working with UNDP on project implementation (for example UNEP or the World Bank).</p>	<ol style="list-style-type: none"> <li>1. Please rate the progress in delivery of outputs. For example, do the annual outputs represent sufficient progress in order to achieve the project outcomes (see DO page of this PIR)? [HS / S / MS / MU / U / HU / n.a]</li> <li>2. Please rate the efficiency in delivery of outputs. For example, in this reporting period are budget resources being spent as planned? (i.e. is project delivery on target?) [HS / S / MS / MU / U / HU / n.a]</li> <li>3. Please rate the quality of risk management. For example, in this reporting period were project risks managed effectively? [HS / S / MS / MU / U / HU / n.a]</li> <li>4. Please rate the quality of adaptive management. For example, in this reporting period were actions taken to address implementation issue identified in the PIR last year? [HS / S / MS / MU / U / HU / n.a]</li> <li>5. Please rate the quality of monitoring and evaluation. For example, in this reporting period were sufficient financial resources allocated to project monitoring and evaluation. [HS / S / MS / MU / U / HU / n.a]</li> </ol> <p>Please justify your rating and address the following points in your comments. Please keep word count between 200 words minimum and 500 words maximum.</p> <ol style="list-style-type: none"> <li>1. Explain why you gave a specific rating.</li> <li>2. Note trends, both positive and negative.</li> <li>3. Provide recommendations for next steps.</li> </ol>
	<p>[IP rating in 2015]</p>
<p><b>UNDP Technical Adviser</b> is the UNDP-GEF Technical Adviser.</p>	<p>MANDATORY RATING MUST BE PROVIDED for ALL projects.</p> <ol style="list-style-type: none"> <li>1. Please rate the progress in delivery of outputs. For example, do the annual outputs represent sufficient progress in order to achieve the project outcomes (see DO page of this PIR)? [HS / S / MS / MU / U / HU / n.a]</li> <li>2. Please rate the efficiency in delivery of outputs. For example, in this reporting period are budget resources being spent as planned? (i.e. is project delivery on target?) [HS / S / MS / MU / U / HU / n.a]</li> <li>3. Please rate the quality of risk management. For example, in this reporting period were project risks managed effectively? [HS / S / MS / MU / U / HU / n.a]</li> <li>4. Please rate the quality of adaptive management. For example, in this reporting period were actions taken to address implementation issue identified in the PIR last year? [HS / S / MS / MU / U / HU / n.a]</li> <li>5. Please rate the quality of monitoring and evaluation. For example, in this reporting period were sufficient financial resources allocated to project monitoring and evaluation. [HS / S / MS / MU / U / HU / n.a]</li> </ol> <p>Please justify your rating and address the following points in your comments. The QORs and delivery data in the ERBM portfolio project monitoring report should inform your rating. Please keep word count between 500 words minimum and 1200 words maximum.</p> <ol style="list-style-type: none"> <li>1. Explain why you gave a specific rating. If your rating differs from the rating provided by the UNDP Country Office Programme Officer and/or the Project Manager please explain why.</li> <li>2. Summarize annual progress and address timelines of project output/activity completion in relation to annual workplans.</li> <li>3. Outline the general status of project expenditures in relation to annual budgets, the effectiveness of project management units in guiding project implementation, and the responsiveness of the project board in overseeing project implementation.</li> </ol>
	<p>Moderately Unsatisfactory (MU)</p>

The cumulative financial delivery of the project is Moderately Unsatisfactory as it could be able to deliver only US\$ 2,803,923 of the total grant of US\$ 5,650,000 considering the project closure date as March 2016. That means, even after 10 years of implementation, the project could only be able to deliver about 50% of the total grant. Project financial delivery during this reporting period is moderately unsatisfactory, which is at around 73% during 2014 and only 8% during Q1 and Q2 of 2015.

RTA along with CO met the PMU on 19<sup>th</sup> February 2015 to follow up on the GBI and finalising AWP 2015 and 2016 as these were not finalized by then. The programmed budget for AWP 2015 and 2016 are US\$ 1.1 million, and US\$ 1.6 million respectively. Provision of Generation Based Incentives (GBI) was approved in a 2014 PSC meeting, but MNRE is apparently retreating on this agreed decision. If that is the case, the project will be left with an amount of US\$ 2 million to be returned to the GEF as unused.

As part of the outcome 1, the outputs reported during this reporting period are (a) a Detailed Project Report along with techno-economic feasibility was assessed for biomass-solar hybrid power project, (2) a report was produced summarising state wise information of available wastelands, existing policies and regulatory frameworks and prospective plan for Odisha, Bihar, and Rajasthan. The activity of biomass-solar hybrid power project feasibility assessment is beyond the scope of biomass power project.

The outputs reported under outcome 2 are, three issues of "BioPower" newsletter was published, and circulated to about 700 stakeholders. Although it was reported that the project has developed a web portal, [www.biomasspower.gov.in](http://www.biomasspower.gov.in), but it was not accessible, as I have tried couple of times to access it.

No activities were implemented under outcome 3 during this reporting period. As part of outcome 4, "Creation of fund for contingent financing", PMU used to report that the Contingent Funding has been discontinued. But surprisingly, during this reporting period, PMU brought up a discussion on "Refinancing Scheme for Biomass Projects" undermining the implementation of generation based incentives (GBI) scheme. Historically, IREDA, a financing arm of MNRE is working on revolving funds and concessional loans. They in fact have provided concessional loans to some of the biomass power plants proposed under refinancing scheme. PMU has failed to explain the reasons for introduction of refinancing scheme. The better option in this case will be sincerely implementing the GBI to revive some of the biomass power projects. This at least guarantees that electricity is generated and supplied to grid and is a performance based incentive tool. This must be easy to implement than administering refinancing schemes, revolving funds and concessional loans at this stage of project implementation.

As part of outcome 5, implementation of Model Investment Projects (MIP), the project supported 1 MW gasifier power plant at Ruchi Soya Industries Ltd in Washim, Maharashtra. This plant was based on Milena technology by ECN Netherlands. Commissioning of the plant would have been in May 2013, but so far this MIP implementation is faced with a number of challenges. In the Milena technology, gasification and combustion sections are different. This leads to better composition of the gas, by reducing the nitrogen. The expected composition of combustible gases is 31% CO, 22% H<sub>2</sub>, 17.4% CH<sub>4</sub> and Nitrogen is just 8% and thus the expected calorific value of syngas is 2,000 kcal/Nm<sup>3</sup>. Whereas Indian fixed bed gasifiers provide about 20% CO, 20% H<sub>2</sub>, 3% methane and nearly 50% Nitrogen and the calorific value of gas is about 1,100 kcal/Nm<sup>3</sup>. If this plant works as per claim, it is going to be a unique demonstration in India.

As mentioned earlier, the project is still challenged with risks such as low tariff for biomass based power plants under Power Purchase Agreements (PPA) and financial institutions are reluctant to support biomass power projects during the last two years. Since the project will be ending by March 2016, it may highly unlikely that these risks will be overcome by the project.

During this reporting period, the project has conducted one project board meeting in February 2015. It appears that sufficient financial resources have been allocated to project monitoring and evaluation as needed. Based on the criteria for IP rating, as the implementation of some components is not in

	substantial compliance with the original/formally revised plan, the project implementation progress can therefore be rated Moderately Unsatisfactory (MU).
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**General comments on Implementation Progress Rating**

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<b>Implementation Progress: Ratings Definitions</b>	
Highly Satisfactory (HS)	Implementation of all components is in substantial compliance with the original/formally revised implementation plan for the project. The project can be presented as “good practice”.
Satisfactory (S)	Implementation of most components is in substantial compliance with the original/formally revised plan except for only few that are subject to remedial action.
Moderately Satisfactory (MS)	Implementation of some components is in substantial compliance with the original/formally revised plan with some components requiring remedial action.
Moderately Unsatisfactory (MU)	Implementation of some components is not in substantial compliance with the original/formally revised plan with most components requiring remedial action.
Unsatisfactory (U)	Implementation of most components is not in substantial compliance with the original/formally revised plan.
Highly Unsatisfactory (HU)	Implementation of none of the components is in substantial compliance with the original/formally revised plan.

## Adjustments

### Project Planning

If delays have occurred in reaching key projects milestones - the inception workshop, the Mid-term Review and/or the Terminal Evaluation - then note below the current status of that milestone, the original planned and actual/expected dates, and comments to explain the reasons for the delays and their implications.

Key Project Milestone	Status (pick one option below)	Original Planned Date	Actual/Expected Date	Comments including reasons for delays and their implications
Inception Workshop	[on schedule delayed/completed delayed/pending n/a]	NA	NA	NA
Mid-term Review	[on schedule delayed/completed delayed/pending n/a]	NA	NA	NA
Terminal Evaluation	[on schedule delayed/completed delayed/pending n/a]	NA	Jan 2016	Shall be initiated in Q3 or Q4 of 2015

### Critical Risk Management

Select from below the critical risks only that appear in the ATLAS project risk log and briefly describe actions undertaken this reporting period to address each critical risk. Please ensure that any 'social' risks identified during the environmental and social screening of the project are reflected in the ATLAS risk log under type/description 'other'. Note that the total number of critical risks is used to calculate the overall risk rating of the project. The methodology to determine the overall risk rating is explained further on this page.

Current/Active Critical Risks (pick one option below; add rows as necessary)	Critical Risk Management Measures Undertaken in 2015
Regulatory - Low tariff for Biomass based power plants under Power Purchase Agreements (PPA) with Distribution Companies and lack of exit options available in PPA to producers.	<p>A Working group has been constituted to look into Barriers and Challenges in Promotion of Biomass Power. The Group is Chaired by the NPD and has the NPC as the Member Convener. The objectives of the Working Group are to:</p> <ul style="list-style-type: none"> <li>Review barriers and challenges faced by the sector and identify key areas related to tariff, financing, secured fuel supply which could be worked upon</li> <li>Suggest suitable policy intervention</li> <li>Suggest actions required at regular intervals for re-validation of Biomass Resource Atlas and also initiate studies on fuel pricing</li> </ul> <p>As a result of the efforts and suggestion given by the Working Group, Central Electricity Regulatory Commission (CERC) revised the tariff for biomass power plants and issued new Tariff Guidelines for Gasifiers. The Working Group has also provided inputs to the on 'Performance/ Viability of biomass based plants operating in India, including prevailing prices'. The Working Group is also in discussion with State Regulators and Agencies, from time to time to revise the tariff. As a result of these efforts, most states have also revised their tariff for the biomass power sector.</p>
Others - The uptake of Biomass projects has been low in the	The project is structuring a Refinancing scheme for Grid connected & operational combustion based Biomass Power. The proposed scheme would provide comfort in the form of refinancing of loan

recent years due to the above factors that have been making projects unviable. Financial Institutions are also not interested in supporting any Biomass power projects in the last two years. Of the existing projects supported by various Financial Institutions, about 60% are under the category of Non-Performing Assets.

component at concessional interest rates to these needy grid connected biomass power projects. For better utilization of the Funds, it is proposed that the support would be provided to biomass projects where there is a possibility of revival of their operations.

Preference would be given to projects in States where the electricity tariff is comparatively less. The projects would be selected from a pool of projects generated by IREDA under the IREDA NCEF refinancing scheme. The scheme is currently under discussion.

***General comments on Adjustments***



## Communicating Impact

All projects must complete this section.

***Tell us the story of your project, focusing on how the project has helped to improve people's lives.***

Please use 500 words or less.

Avoid UN jargon, acronyms, and technical terms. Use plain language.

Include quotes from beneficiaries, if possible, and be sure to provide their names

The following questions can be used as guidance for your story:

What is this project about – the issue, interventions, and impacts?

Who are the beneficiaries of this project?

How have project interventions improved people's livelihoods?

What was the most notable achievement during this reporting period?

This text will be used for UNDP corporate communications, the UNDP-GEF website, and/or other internal and external knowledge and learning efforts.

The project is aimed at removing barriers to increase the use of biomass energy sources for generating electricity for own consumption and export to the grid. It aimed to promote combustion, gasification and cogeneration technologies in India. The project will focus on biomass power project to be undertaken in three different specific contexts: cooperative sugar mills; agro-processors and biomass producers and distributed or decentralised biomass. The project is expected to make use of technical assistance focused on removing the technical, regulatory and institutional barriers to widespread use of biomass power.

Biomass is used for many purposes, food, fodder, and fuel and hence has competing uses. Consequently, the issues with biomass use as resource for energy are complex and dynamic. Cost of power generation and sale is the biggest decisive factor for biomass power promotion. The cost of biomass power is dependent on costs of biomass, other management costs, operation and maintenance and the capital. Biggest variable is biomass cost. To encourage renewable energy including biomass, feed in tariff is offered. However, for biomass power developers, it is a race between the increasing costs of biomass; thereby generation costs vis-à-vis revision of FIT. Further the present decision on FIT is largely based on information and data available from large scale power plants. This is found to be disadvantageous to small scale power plants.

The project made a number of interventions to address these varied issues. They are, establishing Model Investment Projects [MIP]; benchmarking technology packages; enabling promoters, financial institutions, state nodal agencies and other stakeholders; providing a platform for stakeholders to discuss opportunities and challenges; and piloting innovative financing schemes.

The project supported two kind of MIPs for improving PLF of existing biomass power projects and establishing unique greenfield MIPs. In all 37 MW of existing biomass power plants were supported. It is aimed to support 12 MW greenfield projects.

Fuel linkage and processing improvements were supported in four large scale biomass power plants. At 14.5 MW Universal Power, Punjab, modification in the boiler to handle paddy straw bales was demonstrated. This has avoided chipping and handling heaps of chipped paddy straw resulting in ease of operation and cost reduction. Additional 18 decentralized biomass depots (DBD) were set up in a radius of 100 km to collect biomass, reduced the landed fuel cost by USD 4.2 - 4.5 per tonne. Plant has generated employment opportunities for about 1000 people from the local community in biomass supply and processing in addition to about 200 people employed directly in the plant for various operations. 6 MW **SLS Power Ltd., Nellore, Andhra Pradesh** set up 4 decentralized

biomass depots (DBD) within a radius of 50 km to collect various residues, namely cotton stalk, paddy straw, sugar cane trash, etc. to replace rice husks which is currently being used as main fuel. These arrangements have helped reduce the landed fuel cost by USD 5 – 6 per ton. Plant generated employment opportunities for about 900 people from the local community in biomass supply and processing. 7.5 MW **MPPL - Muktsar – Biomass Combustion** set up storage shed, harvesting cum chipping device, material handling equipment, cargo canters to transport biomass from fields and weigh bridges at collection centers. It is estimated that all these facilities helped reducing biomass losses by 5-10%. The biomass supply and conversion has created local employment, increased income to farmers and understood to have positively impacted. It is estimated that 2 to 3% PLF has increased, and reduced landed cost by USD 2.5 to 3 per ton. Based on this experience, Government of Punjab has issued guidelines for subsidy to farmers on purchase of fuel collection equipment's. 9 MW **Panduranga Sugar at Solapur** set up unique feature of bailing trash using trash bailers procured from Netherlands. This has helped the unit to extend the operational days by 60 to 80 days and payback period on additional investment was 1.5 to 2 years. Government of Maharashtra issued guidelines allowing sugar mills to use cane trash in their power plants.

The project also initiated a number of unique green field MIPs. A 1.2 MW Biomass Power Plant implemented by Ankur Technologies, Sankheda, Gujarat demonstrated 100% producer gas based engine and demonstrated 'Open Access' power sale to Aditya Insulators through a PPA agreement, using the Gujarat Electricity Grid availing wheeling facility. This is perhaps for the first time, such a pilot was done at small scale. The plant also demonstrated many innovative solutions - a pyro-gasifier capable of using biomass mixtures of varying properties, dry gas cleaning system reducing wastewater generation significantly, used waste heat for drying biomass and for obtaining chilled water needed for gas cooling-cleaning train using VAM system, by-product biochar as substitute for P-fertilizer and this was demonstrated in experimental plantation sites. Further awareness camps were held for farmers and the whole experience has been documented. A 1 MW fluidised bed gasification system is being commissioned at **Ruchi Soya Industries Ltd. (RSIL)**. Energy Research Centre (ECN) and M/s Dahlman of Netherlands provided technology of OLGA gas cleaning system which reduces the nitrogen in the mixture of gases, increases calorific value of gas. Thermax Ltd., India is the local service providers. The electricity generated will be partially used for factory requirement and partly will be evacuated to the grid. 1 MW gasifier from IISc design is being commissioned by **Cummins Cogeneration Pvt Ltd., in Tamil Nadu**. However, 2 MW **Dee Vee Power** and **2 MW Kandra Energy in Karnataka have not come up due to low feed in tariff in the state**.

Four more projects have been identified, cumulating to 8 MW is in pipeline, namely, two biomass power plants of 3MW and one 1 MW in three islands in Lakshadweep. One biomass power plants of 1MW has also been identified at Andaman & Nicobar islands. Currently these locations are using diesel based power plant which cost about Rs 20 plus per kWh and hence it is expected that the biomass power plants can make economic feasibility.

The project window helped analyse various challenges of the sector and formulate/revise guidelines and policies.

First, Challenges and dynamic changes in biomass power sector was identified. For example, over 50% of biomass power plants had closed down their operations owing to non-remunerative tariffs. To address them, a working group was set up to look into them, identify set of interventions and recommend corrective actions with respective authorities. These dialogues have contributed to following results which are very valuable to the sector. Firstly, Central Electricity Regulatory Commission (CERC) revised the Feed in Tariff for biomass power plants from earlier 5 plus to 7 plus per kWh. But this was not sufficient for bailing out the shut-down biomass power plants. A bail-out package was designed through National Clean Energy Fund by the MNRE. The modalities of using it are being worked out. The new FIT is expected to improve the situation and motivate biomass power developers. The challenge still is implementation of the revised guidance of CERC by the SERCs.



Second, Government of Maharashtra has issued guidelines allowing sugar mills to use cane trash in their power plants based on the learnings from the Panduranga Sugar Cogeneration plant.

Third, Government of Punjab issued guidelines for subsidy to farmers on purchase of fuel collection equipment. This is based on the learning from the MPPL Combustion based power plant at Muktsar.

Fourth, learnings from the operation of 1 MW Ankur plant at Sankheda, Gujarat, the first small scale biomass power plant selling electricity through open access in Gujarat, effected the cancellation of UI charges for the biomass power plants in the State. This project also helped Government of Gujarat to form regulations for Open Access sale for Biomass gasification technology based projects.

Fifth, consultations of stakeholders with regulators and CERC were facilitated. These consultations helped understand opportunities for biomass power and challenges faced in its promotion. These consultations have contributed to increase in FIT and also dialogue on setting differential tariff for small scale biomass power systems.

The biomass power plants provide direct and indirect employment. For example, a 14.5 MW plant at Muktsar provided employment to 1000 people in organising, processing biomass in addition to about 200 people employed at the power plant to manage electricity generation. Thus the 37 MW power plants supported by project has worker base of 5000 people. Smaller power plants provide more employment per MW. One estimate showed a biomass power plant ploughs back over 50% of the turnover from the plant back into rural economy.

To pool information on biomass power and disseminate it to stakeholders, Bioenergy renamed as Biopower quarterly newsletters were published. 13 issues have been published so far. Hard copies were sent to 700 people, soft copies were uploaded on UNDP website and also circulated through UN Solution Exchange of Climate Change which has a membership of over 4000. Biomass portal has been developed with URL <http://viainfotech.biz/Biomass/theme5/library-forms.php> This is expected to serve as one stop information on biomass power.

***What is the most significant change that has resulted from the project this reporting period?***

The most significant change could be positive or negative and could relate to any aspect of the project such as direct beneficiaries, communities, partnerships, policy. The purpose of this section is to capture lessons learned and changes that many not be revealed through the project's logical framework or other parts of the PIR.

This text will be used for internal knowledge management in the respective technical team and region.

Launching of comprehensive biomass portal.

***Describe how the project supported South-South Cooperation and Triangular Cooperation efforts in the reporting period.***

Describe the main focus of the efforts. What is the evidence that the initiative(s) contributed to results?

This text will be used for internal knowledge management in the respective technical team and region.

No activity taken up.

**Project links & social media**

Please list below the website addresses (URLs) that exist for this project, including any links to social media sites. Please include: Project website, Project page on the UNDP website, Adaptation Learning Mechanism (UNDP-ALM) platform, Facebook, Twitter, Flickr, YouTube, Google +	Knowledge Portal launched under the project - <a href="http://www.biomasspower.gov.in">www.biomasspower.gov.in</a>
Please share hyperlinks to any media coverage of the project, for example, stories written by an outside, external source.	
Please upload any supporting files, including photos, videos, stories, and other documents.	[uploading only possible in PIR system; list here the files that you plan on uploading]

**General comments on Communicating Impact**



## Partnerships

All projects must complete this section. Please enter "N/A" in cells that are not applicable to your project.

This information is used to get a better understanding of the work GEF-funded projects are doing with key partners, including the GEF Small Grants Programme, indigenous peoples, the private sector, and other partners. The data may be used for reporting to GEF Secretariat, the UNDP-GEF Annual Performance Report, UNDP Corporate Communications, posted on the UNDP-GEF website, and for other internal and external knowledge and learning efforts. The RTA should view and edit/elaborate on the information entered here.

<b>Partners</b>	<b>Describe innovative aspects of the project in working with (limit = 2000 characters for each section)</b>
<b>Civil Society Organisations/NGOs</b>	NA
<b>Indigenous Peoples</b>	NA
<b>Private Sector</b>	The most significant partnership of the project is with the private sector like M/s Ruchi Soya Industries Ltd and M/s Thermax, in the form of project developers for the Model Investment Projects.
<b>GEF Small Grants Programme</b>	NA
<b>Other Partners</b>	The project has actively engaged with State Nodal Agencies, Regulators and Financial Institutions to address the challenges that are being faced by the sector. The engagement has been through platforms like workshops and meetings and also one to one interactions.

### *General comments on Partnerships*

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## Gender

All projects must complete this section.

This information is used in the UNDP-GEF Annual Performance Report, UNDP-GEF Annual Gender Report, reporting to the UNDP Gender Steering and Implementation Committee and for other internal and external communications and learning.

<b>Has a gender or social assessment been carried out this reporting period?</b>	NA
<b>If a gender or social assessment has been carried out what were the findings?</b>	NA
<b>Does this project specifically target woman or girls as key stakeholders?</b>	No
<b>Please specify results achieved this reporting period that focus on increasing gender equality and improving the empowerment of women.</b>  Some points to consider: impact of project on daily workload of women, # of jobs created for women, impact of project on time spent by women in household activities, impact of project on primary school enrolment for girls/boys, increase in women's income etc. Be as specific as possible and provide real numbers (e.g. 100 women farmers participating in sustainable livelihoods programme).	NA
<b>Please upload the gender or social needs assessment and any other documents related to the project's gender-related results.</b>	NA

### *General comments on Gender*

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## Environmental or Social Grievance

This section must be completed by the UNDP Country Office if a grievance related to the environmental or social impacts of this project was addressed this reporting period.

It is very important that the questions are answered fully and in detail.

*If no environmental or social grievance was addressed this reporting period then please do not answer the following questions.*

*If more than one grievance was addressed, please answer the following questions for the most significant grievance only and explain the other grievance(s) in the comment box below.*

<b>What environmental or social issue was the grievance related to?</b>	NA
<b>What is the current status of the grievance?</b>	NA
<b>How would you rate the significance of the grievance?</b>	NA
<b>Please describe the on-going or resolved grievance noting who was involved, what action was taken to resolve the grievance, how much time it took, and what you learned from managing the grievance process (maximum 500 words). If more than one grievance was addressed this reporting period, please explain the other grievance (s) here.</b>	NA

Rating	Description
Minor	The grievance had/has a low impact on the day-to-day implementation of the project.
Significant	The grievance had/is having a significant impact on the day-to-day implementation of the project, but the project is still expected to achieve its objective.
Serious	The grievance had/is having a serious impact on the day-to-day implementation of the project, and there is a risk (50% or higher) that the project may not be able to achieve its objective.