One of these is the Renewable Portfolio Standard (RPS) system. The "Special Measures Law concerning the Use of New Energy by Electric Utilities" (RPS Law) was enacted in April 2003, and obligates electric utilities to obtain a specified amount of their energy from new energy power generation sources. The portion of energy derived from alternative sources is expected to increase from 3.3GkWh in 2003 to 12.2GkWh in 2010. Included in the definition of new energy is biomass fuel.

The co-firing of coal and woody biomass in the power generation sector, though already underway in the U.S. and European countries, is new to Japan and is facing a variety of technological problems. For pulverized coal-fired boilers, there are roughly two co-firing options. One is to simply pulverize the woody biomass in existing mills and combust the pulverized coal-biomass mixture fuel in a boiler, using the existing burner. This method requires fewer equipment modifications and therefore costs less. However, mixtures of more than several percent of biomass cause the mill’s power consumption to sharply increase due to the difficulty of grinding woody biomass with ordinary pulverizers. The other option is to establish a biomass-dedicated mill. Despite the higher equipment costs, this method is advantageous not only because a higher ratio of biomass can be utilized but also because the amount of NOx generated can be reduced.

Technology development of the latter option, commissioned by the New Energy and Industrial Technology Development Organization (NEDO), is underway.

**Technology overview**

1. **Background**
   
   As part of their global warming countermeasures, industrially advanced countries are implementing policies to promote the adoption of power generation using renewable energy. One of these is the Renewable Portfolio Standard (RPS) system. The "Special Measures Law concerning the Use of New Energy by Electric Utilities" (RPS Law) was enacted in April 2003, and obligates electric utilities to obtain a specified amount of their energy from new energy power generation sources. The portion of energy derived from alternative sources is expected to increase from 3.3GkWh in 2003 to 12.2GkWh in 2010. Included in the definition of new energy is biomass fuel.

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   Technology development of the latter option, commissioned by the New Energy and Industrial Technology Development Organization (NEDO), is underway.
2. Development target

(1) Co-firing ratio of woody biomass: 5-10%
(2) Clearance of current regulatory environmental restrictions
(3) Power generation efficiency comparable to that of existing coal thermal power plants: A decrease in net thermal efficiency of less than 0.5% with a woody biomass co-firing ratio of 5% (on a caloric base).

3. Technologies to be developed

(1) Woody biomass pre-treatment technology (mainly grinding)
(2) Woody biomass combustion technology (co-firing burner/biomass-dedicated burner)

4. Development progress and results

This project, conducted at Chugoku Electric Power Co., Inc., Hitachi, Ltd., and Babcock Hitachi K.K., was commissioned by NEDO, for the evaluation of the pilot plant’s combustion results, with an eye toward commercialization.

R&D timetable

<table>
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<th>2001</th>
<th>2002</th>
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<tr>
<td>Coal/woody biomass co-firing technology R&amp;D (commissioned by NEDO)</td>
<td>Demonstration test</td>
<td>Development of component technologies for processes from receiving to storage, crushing, dry-boiler combustion, and flue gas/ash disposal</td>
<td>Component technology development results-based deployment toward demonstration tests</td>
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<tr>
<td>1. Woody-biomass technology investigation</td>
<td>Planning</td>
<td>Installation work</td>
<td>Demonstration test</td>
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<td>2. Pre-treatment technology development</td>
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<td>3. Combustion test and evaluation</td>
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<td>4. FS for commercialization</td>
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<td>Review of forest biomass utilization by local governments</td>
<td>Utilization planning and system design/verification</td>
<td>Supply system and other improvements/developments</td>
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References