

**Seeking a system to help it satisfy EU regulations, the government agency recently completed a project using EPC Gen 2 tags to track the movement of logs through the supply chain.**

By Dave Friedlos

Nov. 2, 2009—The [Forestry Department of Peninsular Malaysia](#) (FDPM) recently completed a trial of timber tracking and forest management using radio frequency identification. The nation is one of the largest exporters of wood resources in the world, with timber and timber products contributing RM22.5 billion (US\$6.3 billion) of exports in 2008.

Malaysia and the European Union (EU) are currently negotiating a voluntary partnership agreement based on EU-issued regulations for the production of logs and wood products. The EU wants countries that export wood products to adhere to a set of rules providing guarantees that the trees used to make those products were harvested legally, and in an environmentally sustainable manner. The European Union also wants control and monitoring processes to be transparent. Once those controls and processes are put into place, the Malaysian government will be able to issue export licenses that meet EU standards while combating illegal logging. One requirement of the agreement is a national timber-tracking system to improve transparency and traceability in the timber supply chain.



*A forestry department employee reads the RFID tags of a felled tree.*

In Peninsular Malaysia, the inventory of trees is currently performed manually, by reading identification numbers written on markers attached to the trees. It is difficult to trace individual pieces of sawn wood using the system, and practically impossible to go through the paperwork for the whole supply chain in order to guarantee all taxes have been paid, and that the original tree was legally harvested. An automated system, it was determined, would be able to meet such demands. Therefore, the FDPM invited a number of technology suppliers to test both RFID-based and bar-code-based forest-management systems. Tracking software supplier [Helveta](#) was the only company to complete the first phase of the pilot, using an RFID field implementation, after the firm was appointed work with the Terengganu State Forestry Department (TSFD) on a 129,143-hectare (319-acre) concession.

The purpose of the pilot was to demonstrate an RFID-based system flexible enough to meet the legal requirements in the field, says Nigel Dore, Helveta's chief technology officer. "The system was configured to support the inventory of resources pre-harvesting, gather information on harvesting, and capture data at cross-cutting the tree into logs, at the main log yard, on logs being shipped out of the concession, and at a TSFD checkpoint outside the concession," he explains.

All trees tracked through the chain of custody were tagged using one of two passive ultrahigh-frequency (UHF) tags compliant with the EPC Gen 2 and ISO 18000-6C standards. The tags were selected based on availability and form-factor criteria. One tag operated at a frequency of 860 to 960 MHz, the other at 865 to 869 MHz.

RFID tags were either stapled to a tree or log, or nailed in with a hammer, to determine the best method of attachment. None of the tags were damaged during the process, despite the fact that they lacked special protective coverings. Four RFID-enabled [Teklogix](#) Workabout handheld computers, running Helveta's CI Mobile data-capture software, were used in the field to read a unique ID reference number encoded to each tag. From there, RFID-enabled Workabout devices were utilized to confirm the ID number at the various checkpoints along the supply chain as trees were felled, and as logs were processed.

A total of 242 trees were inventoried, 62 of which were felled during the trial, thus resulting in 188 logs being tagged and 81 making it through every control point along the chain of custody. During the project, control points were set up at each location where the wood changed custody, including the points where the original trees were inventoried, harvested and cut into logs, and when the wood arrived at a log yard, left that yard and passed a roadside state forestry station. In a larger project, an export inspection station would be included as a control point.

Helveta's CI World platform was used as a central database to host the data, and reports based on the information gathered were then made available online to stakeholders, thus providing visibility on the flow of wood and wood products moving through the supply chain. Data stored on the Psion Teklogix units was uploaded via a USB connection to an online laptop at the head office, located 30 minutes from the concession. Information could have also have been transmitted through a wireless Wi-Fi interface, or via the mobile network over a GPRS connection.

Reports provided for the project included official forms, such as a pre-harvest inventory and corporate documents. CI World provided checks, analysis and reconciliation of all information captured, and also issued alerts whenever inconsistencies were identified.

According to Dore, there are a number of benefits to using RFID compared with bar codes. These include read-write capabilities that enable a tag to contain the history of the goods being tagged, the ability to enable gantry systems (at high-throughput points, such as processing plants) to identify logs at high speed, and the ability to automatically issue RFID-based documents, such as inventory reports,

log-yard reports and removal passes, all of which included the RFID ID number for validation and cross-referencing.

The system, Dore states, can support such activities as the inventory and management of forest resources, as well as research programs like growth plots and statistical national inventory. In addition, it can also manage and control forest titles and other regulatory documents; manage information on the production, transport and exportation of wood products; generate alerts upon detecting incompatibilities; automate the calculation and collection of forest taxes, in order to optimize forest revenues; provide increased transparency to accounts; and identify illegal activities.

"The configuration of the system to meet the requirement took five weeks," Dore says. "The inventory was taken over two days, and the field piloting of the chain of custody was over 10 to 12 days. A statewide project is expected next year as a follow-on, larger-scale deployment before moving on to national deployment of a forest information-management system. Whether the system will use only RFID, only bar codes or a combination remains to be assessed."

The FDPM declined to be interviewed by *RFID Journal* because the trial is part of a competitive process, and a final recommendation is not due until later next year.