RFID in Service of Forest-Based Industries

"Call for Ideas" on the Conference & Exhibition ON RFID, the next step to the Internet of Things,

Lisbon, 16th November 2007

Agenda

1. The WSCOPPI project idea and consortium

2. Foreseen impact of RFID technology on pulp and paper supply chain

3. Some requirements and specifications for RFID utilization on pulp and paper supply chain

grupo Portucel Soporcel

WSCOPPI: Wood Supply Chain Optimization of Pulp and Paper Industry: project proposal for the 1st ICT call (7th FP)

Related to the Indisputable Key project

Objectives:

- **Innovative ICT for optimization and automation of WSC activities**

- **RFID for wood traceabitiy from forest to final product**

- **Interoperability mechanisms**

- **Implement a prototype**

VTT
TietoEnator
TUT

NHH

Deimos Imaging

Grupo Portucel-Soporcel

FPFP

Link

CEF-ISA

INOV

SPMP
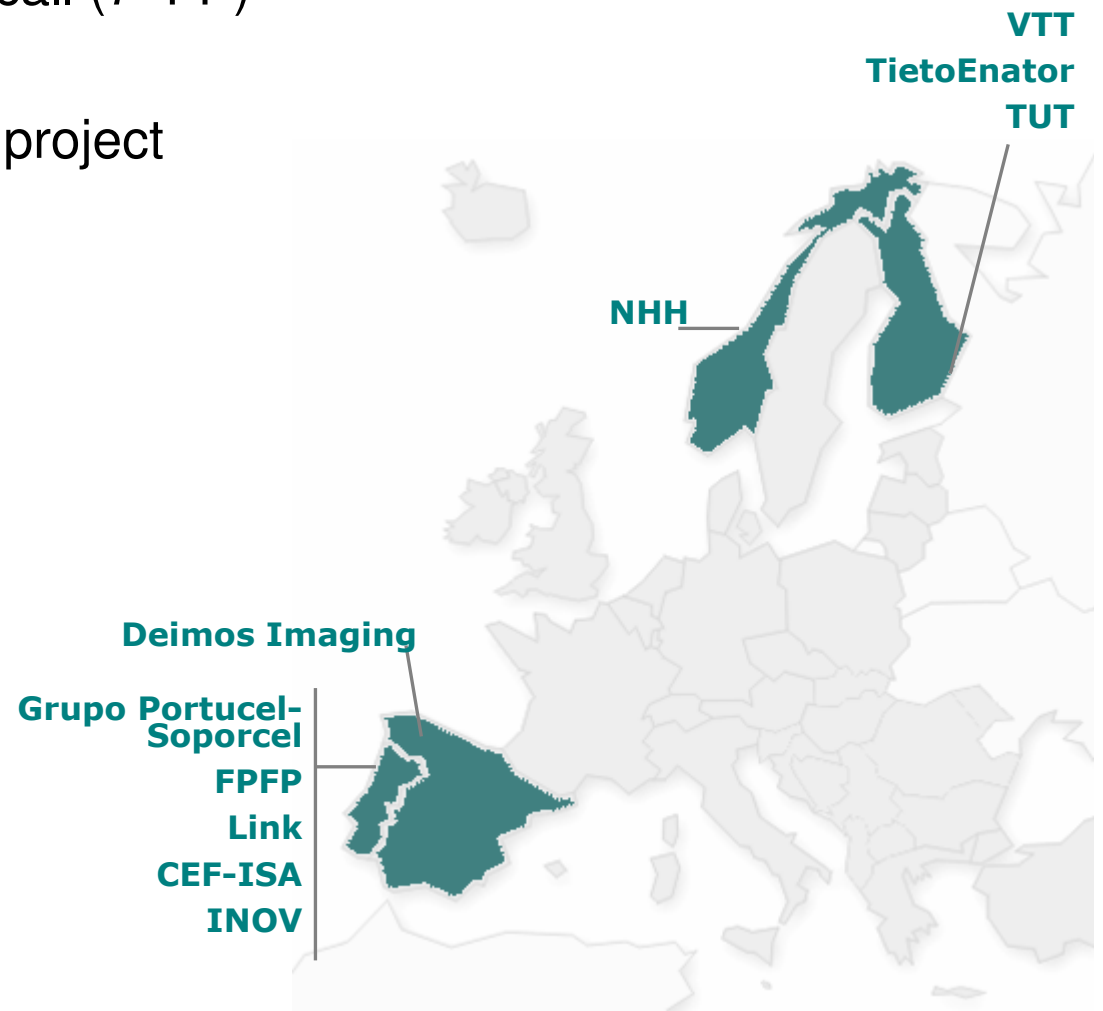
2. Foreseen impact of RFID technology on Pulp and Paper WSC

Increase rentability and competitiveness of forest plantations and pulp and paper industries

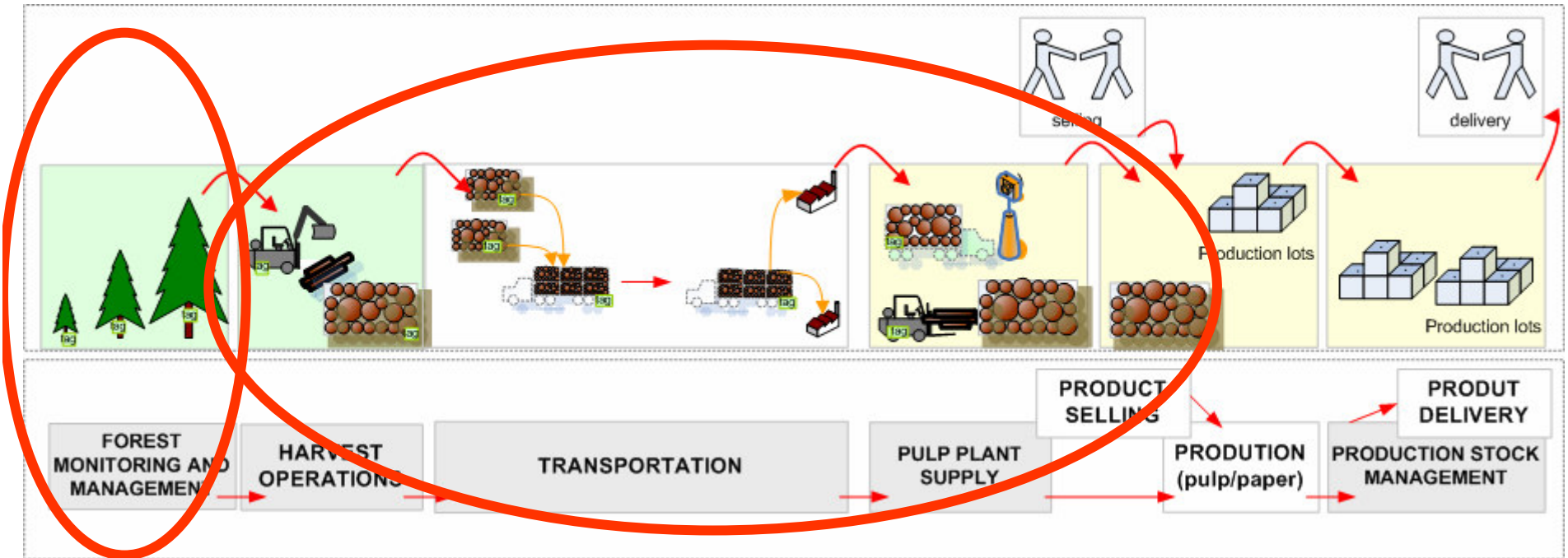1. Allow **individual tree identification for forest monitoring and management:**

   – Identify each tree in inventory plots

   – Control the presence of working teams on the plots

   – Consider the possibility of coupling with sensors

2. Improve the **wood traceability across the wood supply chain,** important for:

   – Facilitate logistic activities, like wood harvesting, transportation and reception at the plant, wood stock movements on the wood yard

   – Requirement for Forest Certification (FSC, NP 4406)

   – Detect wood thefts and illegal logging

2. Foreseen impact of RFID technology on pulp and paper WSC (cont.)

| FOREST MONITORING AND MANAGEMENT | HARVEST OPERATIONS | TRANSPORTATION | PULP PLANT SUPPLY | PRODUCT SELLING / PRODUTION (pulp/paper) | PRODUT DELIVERY / PRODUCTION STOCK MANAGEMENT |

Several years

Forest owners

Some months

Pulp and paper industries

RFID for tree identification

RFID for wood traceability

3. Some requirements and specifications for RFID utilization for forest monitoring

FOREST MONITORING AND MANAGEMENT

Forest monitoring specifications:

– Marking living trees during their entire life cycle

– Allow each tree identification

– Allow the control of forest maintenance operations

– Allow remote monitoring of important growth conditioning factors, such as light and moisture

– **RFID system requirements and further research:**

– RFID tags resistant to weather conditions and with longevity of several years

– RFID readers able to read tags at distance, under wet conditions and without being in the line of sight

– RFID tags support to be permanently installed on a living tree

– [RFID tags with light and moisture sensors]

3. Some requirements and specifications for RFID utilization for wood traceability (cont.)
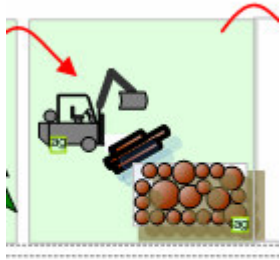
Harvest Operations specifications:

–- Tagging wood logs during mechanical cutting

–- Tag reading during forwarder operations

–- Tag reading for wood stock control in log piles
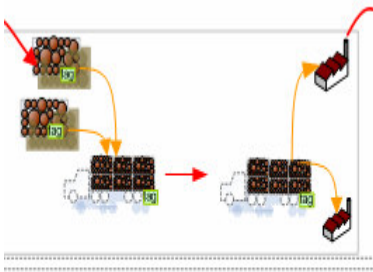
– **RFID system requirements and further research:**

– Sampling method to select the logs to be tagged

– Tagging insertion method (mechanical vs. manual)

– RFID tags easy to insert on the logs (nails?); resistant to weather conditions; with longevity of about 6 months

– RFID readers portable, resistant to weather conditions, work in wet dusty environment; possible to couple in other equipments, long autonomy

3. Some requirements and specifications for RFID utilization for wood traceability (cont.)

- **Wood transportation specifications:**

  - Wood control at the beginning and end of each trip

  - Data collected on the field must be available at real time at the mill reception

  - Just-in-time planning of wood reception

TRANSPORTATION

- **RFID system requirements and further research:**

  - RFID readers portable, possible to couple in truck positioning equipments; at least with 1 day autonomy

  - Fixed RFID readers to be used at the plant entrance at distance and without being in the line of sight; resistant to weather conditions; work in wet dusty environment

  - Data real time synchronization and analysis on a Software BackOffice eventually using communication systems for vehicle positioning

3. Some requirements and specifications for RFID utilization for wood traceability (cont.)

Inside pulp plant specifications:

–- Wood stock control at plant yards

–- No additional operations for tag removal

– Provide information for meeting the COC certification requirements

RFID system requirements and further research:

– Fixed RFID readers to be used on the pulp plant, working at distance and without being in the line of sight; resistant to dusty, dirty conditions

– RFID tags adequate to the previous operations but bio/quimio-degradable during pulp production process

•RFID tags: 2 models

High longevitiy, [sensors]

Bio/quimio degradable

• **Need for efficient tag production process**

•**Need for proper sampling methodology for wood logs**

• **RFID readers:**

    –   **mobile devices for working on forest site, and eventually coupled to harvest equipments or integrated with trucks positioning devices**

    –   **Fixed devices for mill reception and wood yards**

• **Software back Office for data processing and analysis**