



APRIL, Asia Pacific Resources International Ltd.

## **Summary Report on the Strategic Wood Fiber Supply Review**

*Final Report*

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## **APRIL's Long Range Plan Wood Supply Review**

As part of its internal process for independent validation of systems and forecasts, APRIL engaged the Consultant, Indufor Group, to undertake an independent review of the strategic wood fibre supply forecast of the company's commercial plantations supplying PT. Riau Andalan Pulp and Paper mill at Pangkalan Kerinci, Pelalawan, Riau, Indonesia. A similar independent review was previously conducted in 2013. To ensure transparency of the implementation of APRIL Group's Sustainable Forest Management Policy (SFMP2.0) the company requested the Consultant to present their findings to APRIL's Stakeholder Advisory Committee (SAC) during their July 2019 meeting.

The assessment covers plantable areas of APRIL's own concession, its Long-Term Supply Partners and Community Forest suppliers, which at the time of the review comprised of 477 000 ha in total. The future objective of the company is to grow fast-growing plantation forests with resistance to pest and diseases and greater yield. One of APRIL's key strategic goals is to reach self-sufficiency of wood supply to the mill from its own plantations. Today some 20 % of the total annual wood supply is sourced from external market suppliers.

This summary report includes the main conclusions derived from the Consultant's review.

### **Objectives**

The objectives of the study were to:

1. Carry out an independent review of the components forming APRIL's Long Range Wood Supply Plan.
2. To give SAC an independent opinion on the reliability of APRIL's Long Range Wood Supply Plan.

### **Scope**

The review focused on the three major components forming the wood supply forecast:

- a) **Forest Management Information Systems** include the compartment registry, key forest inventory data, tools to plan and execute plantation activities and monitor their progress.
- b) **Forest inventory methods** and activities create and examine the data on forest stands structure and growth over time.
- c) **Growth and yield models** as mathematical tools based on large statistical sample, enabling projection of key tree and forest level parameters over periods of time, for specific tree species and soil types.

### **Methodology**

Indufor completed the assignment as a combination of field and desk analysis. Two Indufor consultants completed a field diagnostics mission in May 2019 at RAPP where they reviewed the relevant business processes with the company team members, observed inventory procedures, measured randomly selected forest plots and collected relevant data for further analysis. Throughout the process the Consultant identified and evaluated factors affecting the long-term wood supply forecast and assessed their potential impact on the forecast reliability. The evaluated factors affecting the wood supply forecast are presented in Table 1.

**Table 1. Evaluated factors affecting the wood supply forecast.**

<b>Evaluated factors</b>
<p><b>Forest Management Information Systems (FMIS)</b></p> <p>Functionality of the FMIS</p> <p>Consistency and completeness of records</p> <p>Frequency of system updates</p>
<p><b>Forest Inventory Methods</b></p> <p>Inventory teams' performance and equipment</p> <p>Inventory sampling</p> <p>Inventory procedures</p> <p>Plot level calculations</p> <p>Internal audit of forest inventory</p>
<p><b>Growth &amp; Yield Models</b></p> <p>Sample design and data coverage – Tree volume models</p> <p>Sample design and data coverage – Growth and Yield models</p> <p>Testing of models</p> <p>Selection of model form and estimation of parameters</p> <p>Growth model update interval</p>

## Findings

The Consultant views that the target of future growth increase and the methods applied in the wood supply forecast are realistic. The key factor defining the success will be, how the average productivity of currently low- and mid-productive areas can be raised close to the level of the top productive areas in the following years.

APRIL has achieved notable growth improvement through improved silvicultural activities, replacing *Acacia mangium* with faster growing and resilient *Eucalyptus sp*, improved control of pests and diseases and increased coverage of rehabilitation planting of damaged areas.

Key contributing factors to achieving the future plantation productivity target will be maintaining the optimal water table management at every phase of tree growth for *Acacia crassicarpa* in the peatlands; and the development and choice of correct clones by site type, for *Eucalyptus sp* on mineral soil.

Target timeframe for reaching the supply goals is strict and allows little space for setbacks or recession in growth development. Current data and information systems offer APRIL reliable tools for continuous monitoring of status and growth of the plantation.

Based on the Consultant's review no fundamental flaws exist in important processes forming the company's long-range wood supply forecast. The forecast is updated every six months and is based on credible data inputs from forest inventory and growth and yield modelling and robust information management systems. These components are collectively used to predict the forest growth in large scale and produce harvesting plans based on the set of objectives, management rules and constraints.

The company has well-developed in-house systems and practices in Forest Management Information Systems (FMIS), linked with a range of software, to function as a complete system for plantation and wood supply management. The system stores and processes most important data and is easily accessible and updatable. Based on the Consultant's review the system functions well and has a good track record of serving APRIL with the various tasks. Ongoing



modernization process that includes the implementation of mobile applications is viewed as an improvement to data updating, management, extraction and transparency.

APRIL's Forest inventory procedures, skills and tools are largely comparable to industry standards and provide a reliable basis to conduct accurate large-scale forest inventory. The inventory audit enables the continuous control of measurement quality and objectivity. The Consultant proposed a few technical improvements related to the tree height measurement, automated error checking for data entries as well as improving the accuracy of the plot location.

APRIL has developed comprehensive growth and yield modelling procedures. Its major strength is the calibration of models based on extensive local data samples of almost 80 000 measured and frequently updated forest inventory plots covering the whole variability of the plantation. Model functions used by APRIL are well-known and utilized by forest biometricians around the world. The Consultant proposed a few technical improvements related to the modelling of individual tree parameters and improving the fitting of forest level growth and yield functions.

### **Conclusions**

By 2024, APRIL's RAPP mill is expected to be self-sufficient in terms of wood supply. Wood sourcing from open market will decline over the next 5 years, while the productivity of own plantations will increase. Future growth target and methods to materialize it are realistic as such. Target timeframe is strict. Choice of correct clones and silviculture activities including water management is critical for achieving yield targets.

Based on The Consultant's field and desk analysis, the data and methodology used for APRIL's long term wood supply forecast did not include any significant shortcomings or inconsistencies that set the forecast results questionable.



### **About Indufor Group**

Indufor Oy is an independent international consulting company with the head office in Helsinki, Finland and regional offices in Auckland, New Zealand; Melbourne, Australia; Washington, D.C., United States and representation in China. The Company provides world-class advisory services to a wide range of public and private sector clients around the world in natural resources management, investment advisory, and strategic industrial development. Indufor is fully owned by management and staff members. The Company's multilingual specialist staff comprises of some 70 people with advanced university degrees. In addition to own staff, Indufor employs approximately 60 subconsultants and has a broad consultant specialist roster, having now more than 4 000 registered specialists in the fields related to natural resources management.

Indufor has completed over 900 consulting assignments in more than 100 countries worldwide since 1980 and has accumulated a wealth of knowledge and experience of forestry and wood product businesses around the world.

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