

■ MB-32

Monday, 10:40-12h00
8.2.17

OR in Forestry I

Stream: OR in Agriculture and Forest Management
Invited session

Chair: *Andrés Weintraub*, University of Chile, Santiago, Chile, aweintra@dii.uchile.cl

1 - Optimal weights in route distance generation

Mikael Rönnqvist, Department of Finance and Management Science, Norwegian School of Economics and Business Administration, NO-5045, Bergen, Norway, mikael.ronnqvist@nhh.no, *Patrik Flisberg*, *Bertil Lidén*

Contracts between transporters and forest companies are often based on the driven distance. However, this distance can often be hard to agree on because of many attributes e.g. length, quality, width, speed limits, etc. We present an approach to find a set of optimal weights for more than 30 attributes. An important part is a set of detailed "Solution routes" where the forest companies and transporters have agreed. Then an optimization model is formulated where the main variables are the weights on each attribute. Results and experiences from an industrial implementation are reported.

2 - Dynamic log yard designs for an improved coordination of sawmill and log yard operations

Luc LeBel, Sciences du bois et de la forêt, université laval, 2405 de la terrasse, g1v 0a6, Quebec, Quebec, Canada, luc.lebel@sbf.ulaval.ca, *Daniel Beaudoin*

Sawmills have traditionally kept high level of inventory in their yards for seasonal considerations. We attempt to find the optimal assortments to store through a Forward-Reserve Problem (FRP). The classical FRP was extended to a multi-period FRP in the context of a divergent process industry. The multi-period context allows for changes in assignments to the forward area as market conditions change. In order to account for the divergent nature of the industry, the FRP formulation has been extended to anticipate production at the mill based on known demands and market anticipation functions.

3 - A solution of the cable corridor layout problem for harvesting under steep slope conditions

Leo Bont, Institute of Terrestrial Ecosystems, CH-8092, Zürich, leo.bont@env.ethz.ch, *Hans Rudolf Heinemann*, *Richard Church*

The spatial layout of forest harvesting systems is a task which highly affects operational efficiency. Under steep slope conditions cable systems have been used for timber extraction, being laid out by rules of thumb, especially in Europe. Here we introduce a modelling approach for the cable corridor layout problem, assuming that the road network is given. We formulated the problem as a set cover mixed integer programming problem. Our approach will be useful for assessing layouts for different cable systems and to investigate the effectivity of road network layout for cable systems.

4 - Mixed Integer Programming Models to Evaluate Integrating Strategies for Value Chain Management: a Case Study of the Chilean Forest Industry

Andrés Weintraub, University of Chile, Santiago, Chile, aweintra@dii.uchile.cl, *Juan José Troncoso*, *Sophie D'Amours*, *Mikael Rönnqvist*

We present a mixed integer programming model to evaluate two different integration strategies in order to show the impacts of a fully demand driven integration of the value chain in the forest industry. To illustrate our thoughts, we use forest, economic and production information from a Chilean forest company. We compare two different integration strategies: the first one where the forest and the industry planning are decoupled and the second, where all parts of the value chain (forest, transportation, mills) are driven by final product demand.

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Monday, 10:40-12h00
8.2.19

Energy Policy and Planning

Stream: Energy, Environment and Climate [c]
Contributed session

Chair: *Sandrina Pereira*, IDMEC-IST, Avenida Rovisco Pais, Pav. Mecânica, 2º andar, 1049-001, Lisboa, Portugal, sandrinapereira@ist.utl.pt

1 - Decision Support System for Low Carbon Regions

Sandrina Pereira, IDMEC-IST, Avenida Rovisco Pais, Pav. Mecânica, 2º andar, 1049-001, Lisboa, Portugal, sandrinapereira@ist.utl.pt, *Anildo Costa*

This paper analyse the usefulness of Scenario Building and Analysis - SBA and simulation models such as Agent Based Models — ABM, as methods to develop energy policies and pathways towards Low Carbon Region - LCR. SBA can illustrate the influence of technology in GHG reduction but technology evolution by itself will not be enough to achieve LCR. Also, energy consumption is influenced by consumer's behaviour and social values which are better captured by ABM. A methodology to achieve LCR based on SBA (to assess technology) and ABM (to assess influence of society behaviour) will be described

2 - Energy Indicators for Sustainable Development

Athanasios Angelis-Dimakis, Chemical Engineering, National Technical University of Athens, Heroon Polytechniou 9, Zografou Campus, 15780, Athens, Greece, angelis@chemeng.ntua.gr, *George Arampatzis*

Energy planning for sustainable development at regional and national level is a basic priority for every country. The scope of this paper is to develop a set of indicators in order to assess the economic, social and environmental aspects of an energy system's sustainable development. Those indicators give an overall picture of a country's energy system. Furthermore, as they fluctuate over time they will be good markers of progress and underlying changes and will guide decision-making on investments in energy. The set of indicators will be applied to the case of the Greek Energy System.

3 - An n-K Contingency-Constrained Unit Commitment Model via Robust Optimization

Fabrcio Oliveira, Industrial Engineering, PUC-Rio, Av. Marquês de S. Vicente s/n, Gávea, 22453-900, Rio de Janeiro, Rio de Janeiro, Brazil, fabricio.carlos.oliveira@gmail.com, *Alexandre Street*, *José Manuel Arroyo*

This paper presents a new approach for the contingency-constrained unit commitment problem. The model incorporates an n-K security criterion by which power balance is guaranteed under any contingency state comprising the simultaneous loss of up to K units. Instead of considering all possible contingency scenarios, which would render the problem intractable, a novel scenario-free formulation based on robust optimization is proposed. Unlike scenario-based approaches, the robust model does not depend on the size of the set of contingencies, thus providing a computationally efficient framework.

■ MB-34

Monday, 10:40-12h00
8.2.23

Solution Approaches for Lot-sizing Problems II

Stream: Lot-sizing and Scheduling, Economic Order Quantity

Invited session

Chair: *Bernardo Almada-Lobo*, Industrial Engineering and Management, Faculty of Engineering of Porto University, Rua Dr. Roberto Frias s/n DEIG, 4200-465, Porto, Portugal, almada.loba@fe.up.pt

1 - An Efficient Computational Method for Non-Stationary (R,S) Inventory Policy with Service Level Constraints

Mustafa Dogru, Bell Labs, Alcatel-Lucent, BLANCHARDSTOWN INDUSTRIAL PARK, 15, DUBLIN,