

## CABLE-YARDING IN FRANCE : PAST, PRESENT AND PERSPECTIVE

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**Abstract:** France has a national standing wood stock close to 3,000 million cubic meters, and more than a quarter of its forested area is in steep terrain (slope > 30%). Cable yarding should be a common logging system in the country, but is not. Until the 1960's, the use of cable yarding was traditionally found in the Alps mountains, and to some extent in the Pyrenees mountains. Since then, many developments, among which is the implementation of the logging strategy "forest roads opening + wood extraction by cable skidder", have resulted in the decline of cable systems. The limits of this strategy have been reached, especially with the reduction of public subsidies, which compromised very much the economical feasibility of logging in mountainous areas. New incentives have to be defined to give new perspectives to this environmentally friendly technique.

**Key words:** harvesting incentives, cable-yarding in flat terrain, training.

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### Introduction and Context

The forest area in France is 150 000 km<sup>2</sup>. It is 27% of the total surface of France.

The wood stock is close to 3,000 million cubic meters (wood volume up to the terminal bud). France ranks at the first place in European Economic Community (EEC) just in front of Sweden and Germany in terms of forest inventory. The annual roundwood production is 35.4<sup>1</sup> million cubic meters (4th place in EEC). This is a quite small figure considering that annual growth is 91.5 million cubic meters. (Memento AFOCEL 2006)

The data base of the National Forest Survey reveals that more than 35% of the wood stock volume is in mountains. In these areas, coniferous forest (*Pinus sylvestris*, *Picea abies*, *Abies alba*) are predominant except in the Pyrenees where 70% is broadleaved, mainly *Fagus sylvatica* (Barthod, C. and Pignard, J. 1998).

For the last 3 decades the harvested volume has decreased because of the low competitiveness of logging in steep terrain and a lower quality of the wood in the mountainous areas (especially in the Alps and in the Pyrenees). The results are forest ageing and timber capitalization on the stump, gaining 17% in ten years according to the last forest survey.

For the last ten years there has been a high public

support toward logging in mountainous forests again with expected benefits in terms of sustainable forest management (renewing and tending of stands), protection against landslides and erosion and economical development of the forest industries, still present in those rural areas. Good forest management means also enhanced landscapes and development of tourism, especially for winter sports.

In this context, forest managers and logging companies would like to give a fair place to cableyarding and launch some incentive actions to increase its utilization in France.

### History and Recent Trends of Cable Utilization in France

Cable-yarding history in France is linked to the situation in Italy where cable transportation was born at the end of the XIX<sup>th</sup> century. During the First World War, this transportation system has been improved in relation with its utilization for heavy transportation in difficult mountainous areas. Many technicians, trained to use cables during the war, afterwards used their know-how for wood extraction. Those specialists came to France and began to work in the Alps. During 1940-1960, when the first specific motored winch was created in 1939 by Wyssen, Switzerland, many cable systems were used in Switzerland, Austria, Germany and France. This was the golden era of cable-yarding in the Alpine area.

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<sup>1</sup> Except fuel wood harvested for self consumption (evaluated to 20 millions cubic meter from forest).

In the 1960s, the rural exodus, increasing wages, and the development of the ground-based system (forest roads opening + wood extraction with skidder) induced the decline of cable-yarding in France. In the 1970s only a few crews were still using this extraction system in competition with some helicopter-logging crews.

Since 1990, forest managers have been trying to create a new dynamic for cable-yarding with the support of public subsidies.

Today, 11 logging companies are equipped for cableyarding. This number has been decreasing since 1999 (16) but it is still evolving. . During the subsequent 7 year period (1999-2006), 9 companies have been created, but 14 have also disappeared. Only, 4 enterprises created before 1999 are still operating in 2006.

Some foreign enterprises are joining their work capacities to the French ones (Silande G.1999, Le Bois International, 2005).

The kind of material used in France has changed over time: long winch skylines (with lines up to 2,000m long) have been replaced by cable crane. Indeed, in the past, French crews mainly worked with long cables until 2000. Of course these systems remain useful in the hillsides where the road network is not very dense.



**Long distanced skylines require skilled and agile Workforce**

The annual production by cableway was 85,000 m<sup>3</sup> in 2004 (and 50,000 m<sup>3</sup> in 1999). Foreign enterprises produce 25%. Despite some effort and political willingness, this system has still a very limited place in France, representing less than 0.2% of the total harvested roundwood. (Bartoli, M., 2005)

In Italy, Switzerland, and Austria, 10 to 20% of the harvested wood is extracted by cableway. However, in France, a realistic target would be around 5% for the mountainous areas, that is to say 1% of the national harvest (400,000 m<sup>3</sup>/year on 35 million cubic meters).

Some measures have already been implemented to achieve such a goal but some others have probably to be considered too.

### **Recommendations to Develop Wood Extraction by Cable-Yarding in France**

Provide financial support for investments and operation costs

Since January 2007, cable systems in France can be subsidized to a total value of 40% of the purchase price like most of the other logging equipment. Grants come from the European Union funds for economical development of rural areas and from local administration aimed at supporting forestry. They are combined and organized in what we call the "incentive program". For the next 7-year incentive program, the grants will concentrate only on cablecranes in order to have a pool of equipment with the latest technological developments. These include the mono-cable system with a self propelled carriage, integration of a knuckle boom loader or a processorhead mounted on the same trailer as the yarder. These systems are preferred because they are quickly installed and moved. Moreover, they require a smaller workforce for the extraction itself.



**The cable cranes are now replacing the long distanced skyline equipment.**

In the Pyrenees and the northern Alps, the public authorities also allot subsidies for the cable extraction operation itself. In the Pyrenees, the amount of the financial aid is based on the difference between the mean cost of extraction with a skidder and the estimated cost of extraction with a cable system. In the Alps, 10 €(\$US 13.2) per meter of hauling line are given to the forest manager (National State Forest Agency, ONF, for public forests and forest owner cooperatives for private forests). This compensates for the extra costs related to the time needed to

calculate the position and to install the lines. These financial supports have proven to be very essential. Even with the grants dedicated to the investment, technical costs for cable-yarding are definitively higher than the ones for extraction with a skidder (Table 1).

Another way to support the development of cableyarding in France consists in developing the conditions to improve the rate of utilization and the annual productivity of the equipment.

**Table 1. Productivity and cost of different logging systems in France (Chagnon and Pischedda, 2005.)**

	Average productivity (m <sup>3</sup> /day)	Technical cost (felling, trimming and extraction) in €/m <sup>3</sup>
Skidder	40	23.7
Long winch skyline	25 to 32	52.8
Cable crane	40	41.7
Helicopter	90	55.0

1 €equal 1.32 US Dollar

### Increase the annual production of cable crews

A survey carried out at the end of the 1990s (Silande G., 1999) showed that, generally, the crews work only 6-7 months per year, apart from the snow period. The rest of the year is devoted to another job (working in winter resorts mainly). As a result, the annual production was roughly around only 3,000 m<sup>3</sup> per cable equipment and crew (composed of 3-4 people).

To enable the crew to be able to work all the year round, more timber should be sold in areas requiring cable-yarding: in medium mountains (Massif-Central, Pyrenean piedmont) or on sensitive grounds in the plains.

Indeed, in some situations in flat terrain it is essential to limit the risks of soil compaction that can be very prejudicial to long-term forest production. This is the case, for example, for hydromorphic or peaty soils, or in wooded lands with a dense network of streams. In such situations, the self-propelling carriage with one cable seems particularly suitable because it is easy to install and move. Nevertheless we must keep in mind that cable-yarding is expensive. Therefore, cableyarding can be done in situations where the forest owner is ready to give up a part of his income for environmental considerations. Up to now, the cost of the impact of soil compaction has not been quantified. Such an analysis is needed for a better

assessment of the long term benefit/cost ratio of cable-yarding on flat terrain.



**Cable-yarding is an environmentally friendly solution adapted to sensitive flat terrain.**

### Improve training and knowledge transfer of cable-yarding techniques among foresters and loggers

Forest managers know little about this little used technique. It is essential to inform them better about it. Interactions between silviculture and logging operations are particularly important in steep terrain. For cable-yarding, a dialogue is essential between the forest manager, who marks the trees to be removed, and the logging company who calculates the location of the lines. This dialogue is not an easy matter to

achieve in the French context where each player in the forestry sector is quite independent!  
ONF is making great efforts to teach its foresters the technique of cable yarding, for utilization in both mountains and plains.

There is also a need to train the logging operators. Logging companies need a skilled and steady workforce and very motivated. This is because this cable yarding remains very difficult physically despite notable ergonomic improvements over the last 10 years (i.e., automated yarder systems, radio controlled chokers, self-propelled carriage). Versatility and capacities of adaptation are also necessary qualities; each forest site is a particular case.

In France, there is only one training center for cableyarding in the Alps. The trainees, 4-5 each year, alternate periods in the center and in a logging company during 47 weeks. They all have basic forest education before entering the training center.

A recent inquiry performed among the cable logging companies shows that they encounter serious problems of recruitment. This applies to the whole logging sector in France but for cable-yarding, it is a particularly accurate point because the work is carried out by a crew. The difficulties of recruitment and the turn-over in the crews are undoubtedly the major explanatory factor of the weak performance of the French cable-yarding companies.

## **Perspectives**

The keyword of forest managers in France is "we need to harvest more in mountainous areas because the wood stock is too high". The ground-based system (forest roads + skidder) has reached its limits. Funds for creating new forest roads are not available any longer. However, the skidder operators can't go further than 100 m downhill and 50 uphill from the existing forest roads. Cable-yarding should take advantage of this situation.

In this paper several common-use actions to boost the development of cable-yarding have been presented. But more than financial aids, French small enterprises need also some individualized assistance in different fields: techniques, workforce, and organization. A small guidance unit, made of 2-3 specialists, should be set up to provide assistance to the new enterprises, particularly to those who are benefiting from public subsidies.

Another important topic is the cooperation between

logging contractors, timber buyers and forest managers. There is a lack of communication between these different actors of the wood procurement chain. Two topics are particularly important:

- the benefits/cost ratio of cable-yarding must be re-estimated considering the sustainable development point of view: reduction of soil compaction, regeneration of aged forest stands....,
- contractors are very small enterprises that need to have a clear view of their order-book. Longterm selling contracts should be proposed to them by the forest owners or managers.

There is a large need to study the different kinds of cable systems that can be implemented under the French conditions and especially in broadleaved stands. All the equipment is designed outside France under different logging constraints in terms of silviculture and the forest road network as well as under a different socio-cultural background.

As a last point, with the target to increase the production of renewable energy in Europe, new concepts of cable extraction should be tested in mountainous areas, especially for whole trees.

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