

A forest species of the future: the maritime pine, France's first resinous pine

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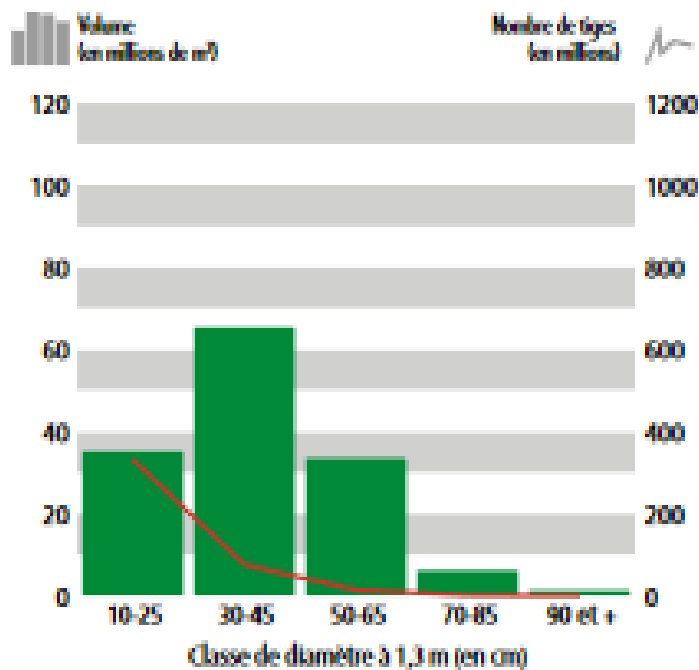
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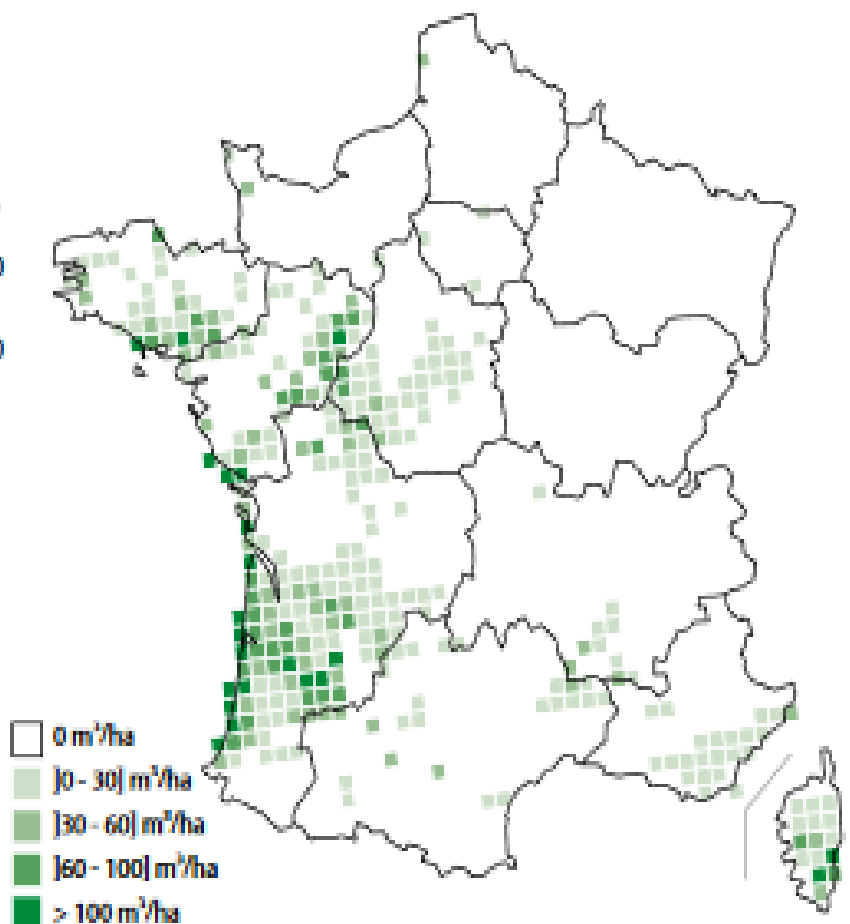
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Maritime Pine in France



Volume and number of trees per diameter class



Average volume per ha (cubic meter/ha)

Distribution of forest species and climate change



Current situation (2007)



Climate scenario B2 : 2100
Hypothèse : élévation moyenne de
2.4 °C des températures



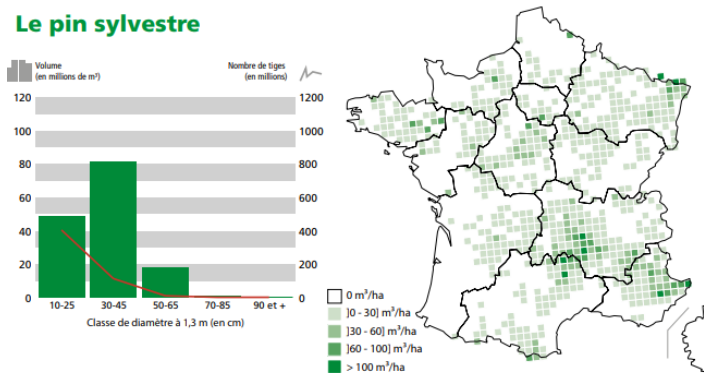
Climate scenario A2 : 2100

| | | % actuel | % 2100 B2 | % 2100 A2 | |
|------------------|---------------------------------|----------|--------------|--------------|---|
| Montagnard | Groupe 1 (Pin cembro) | 5.2 | 2.3 | 1.0 | ■ |
| | Groupe 2 (Aulne incana) | 4.1 | 3.0 | 2.4 | ■ |
| | Groupe 3 (Sapin blanc) | 6.3 | 0.1 | 0.3 | ■ |
| Plus continental | Groupe 4 (Hêtre) | 22.4 | 3.2 | 1.2 | ■ |
| Atlantique nord | Groupe 6 (Châtaignier) | 35.6 | 17.4 | 16.4 | ■ |
| Atlantique sud | Groupe 7a (Pin maritime) | 17.2 | 45.9 | 30.8 | ■ |
| Méditerranée | Groupe 8 (Chêne vert) | 9.1 | 28.1 | 47.9 | ■ |

Tableau 3: Proportion du territoire couvert par les aires biogéographiques actuellement et selon les deux scénarios : A2 et B2 (communication personnelle du 4 septembre 2007, V. Badeau et J.-L. Dupouey). (la composition des groupes est en annexe 4)

Others pine species and potential resin harvesting

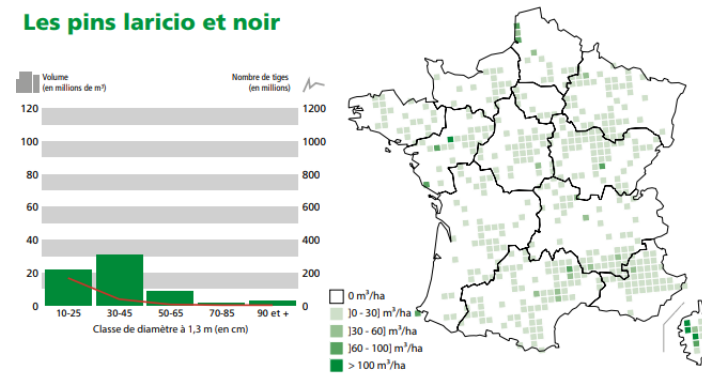
Le pin sylvestre



Volume et nombre de tiges de l'essence par classe de diamètre*

Volume moyen à l'hectare

Les pins laricio et noir



Volume et nombre de tiges de l'essence par classe de diamètre*

Volume moyen à l'hectare

Très peu
gemmé en
France car
rendement
très faible (0.1
l/arbre à 1.7
l/arbre/an)

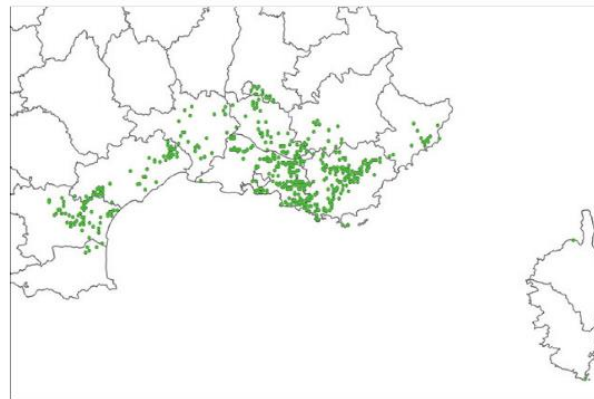


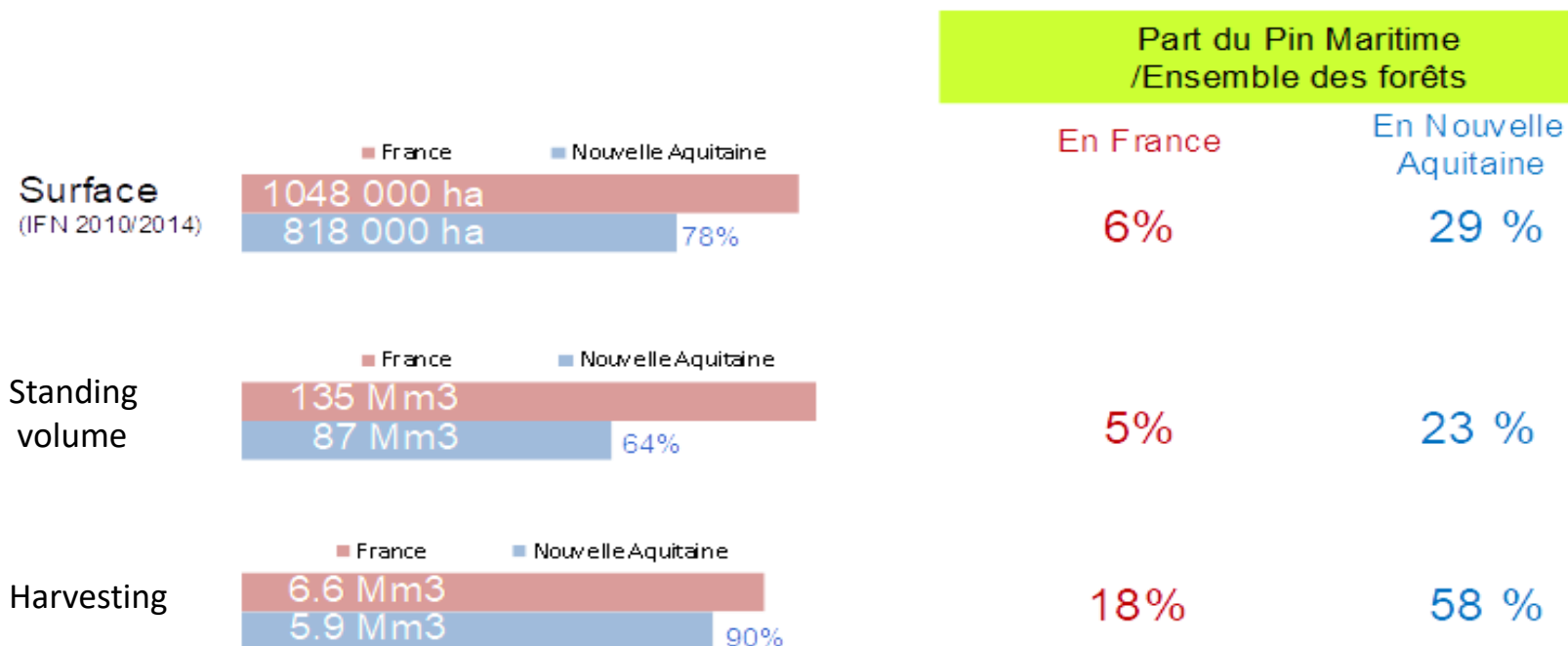
Figure 3.4. Carte de répartition du pin d'Alep en France d'après les données IFN (période 2005-2011). Chaque point représente une placette d'inventaire avec le pin d'Alep comme essence principale.

Pin d'Alep : volume estimé en PACA:
14 millions de m³ et surface
forestière estimée à 145 000 ha.

Pin d'Alep : GRECO méditerranéenne
140 000 ha de peuplement monospécifique pour un volume de 11 Mm³
85 000 ha de peuplements mélangés Chênes et pin Alep pour un volume de 6 Mm³

A species of the future: maritime pine is the first French softwood

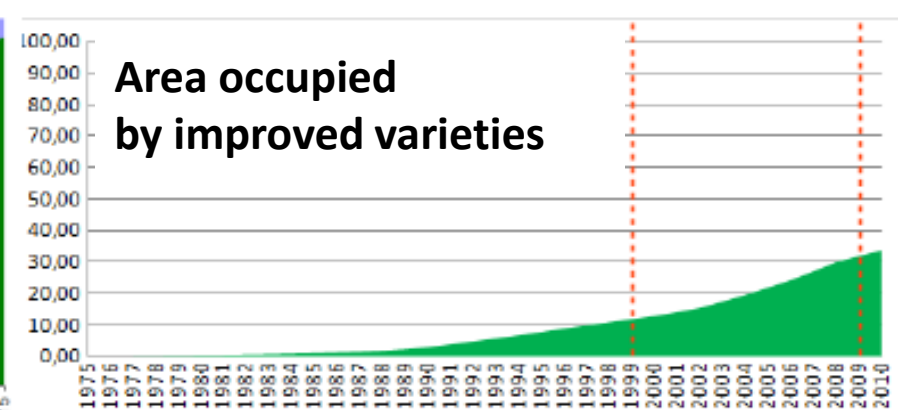
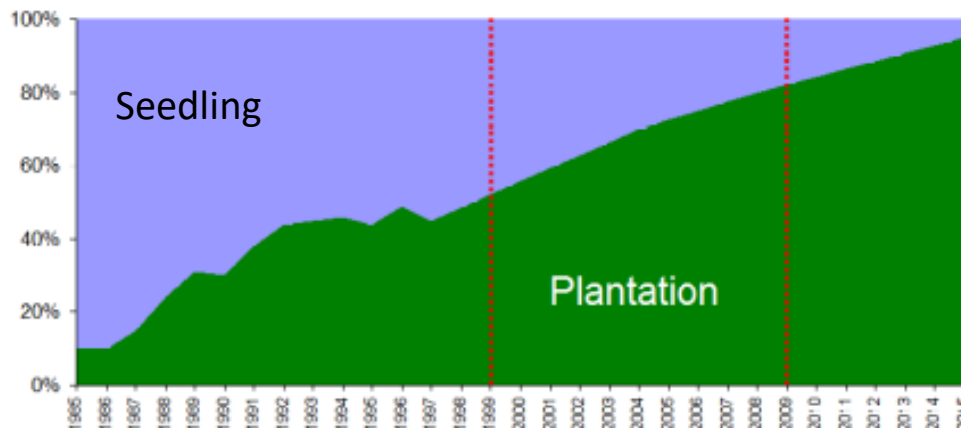
- Native tree, well adapted to poor soils
- Most planted tree in France: 34,000 ha in 2014/2015
- 44 million plants, 61% all forest plants sold in France



Storms and reconstruction

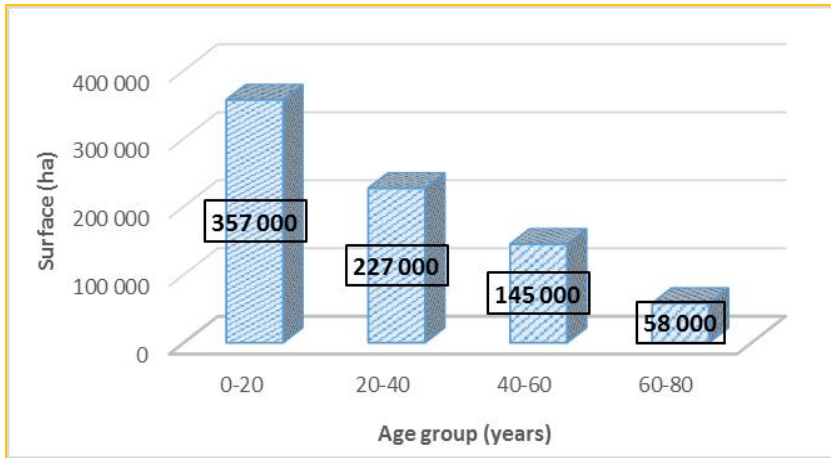
| Pin maritime | MARTIN 1999 | KLAUS 2009 |
|-------------------|-------------------------------|-----------------------------------|
| Destroyed volume | 23 millions de m ³ | 37 millions de m ³ |
| Destroyed area | 150 000 ha | 210 000 ha |
| Construction area | 88 000 ha | 205 000 ha (Objectif/en cours) |

- **Renewal of the age classes of the massif: rejuvenation**
- **increase in genetic progress through planting instead of seeding**
- **Greater consideration of risk in management**

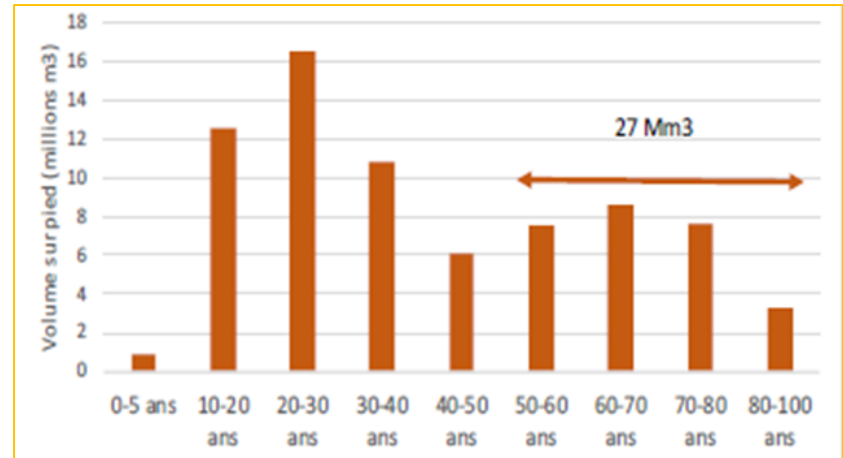


Area and volume of maritime pine by age group

2005-2010 data: National Forest Inventory



2016 data: National Forest Inventory

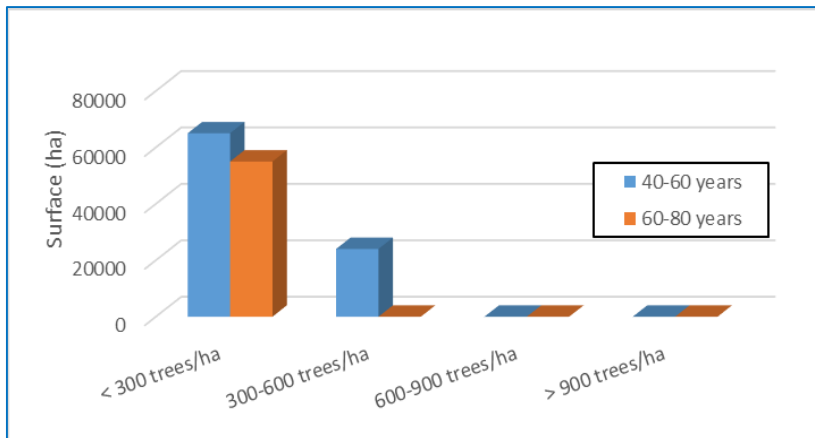


High potential for harvesting maritime pine resin :

- 200,000 ha of maritime pine over 40 years old
- 27 million cubic meters of maritime pine over 50 years old

Estimated resin production potential (based on 2005-2010 data)

Area of maritime pine for 2 age classes and by density class (2005 -2010 data)



| Age classes | Average density (trees/ha) | Total area (ha) | Number of trees |
|--------------|----------------------------|-----------------|-------------------|
| 40-60 years | 150 | 120 000 | 18 000 000 |
| 60-80 years | 350 | 24 000 | 8 400 000 |
| TOTAL | | | 26 400 000 |

| | |
|--|-----|
| Average resin production per tree (Kg) | 2.8 |
| Average resin production per tree (L) | 3 |

Total resin production estimated over one year (kg) : 73 920 000 kg or 79 200 000 L

- Total production of maritime pine resin estimated over a year (2005–2010 data) is 74 tonnes (corresponding to total resin production in Indonesia in 2009)

- Resin production in 1937 : 100 000 000 litres (93,000 t) – 144 l/ha (134 kg/ha)

Questions about Resource modelling in a context of climate change

10 -What is the potential future for resin production in New Aquitaine in the forest?

**11- What is the potential for resin production in the New Aquitaine sawmill sector?
How to extract the resin contained in the pine planks at the time of drying?**

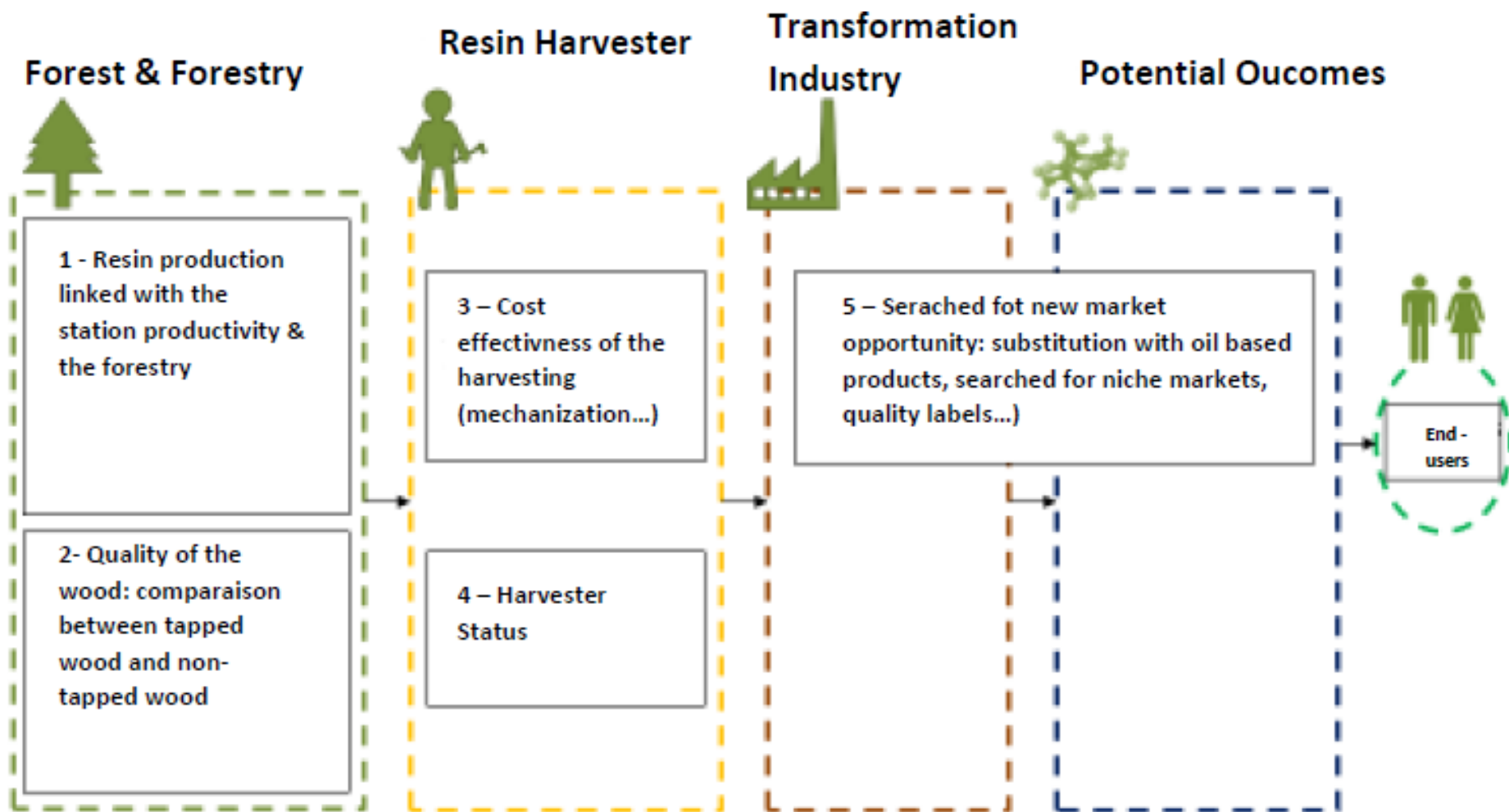
12 -In a context of climate change, will the geographical area of the maritime pine change?

13- Are there other outlets for the use of resin outside New Aquitaine (in PACA, Corsica) ?

14 -Does the improvement of the genetic varieties have an effect on resin production?

15 – To maintain the economic profitability of the business, what is the maximum distance between the place of harvest and the location of the distillery?

What you expect from the project : Five results to develop





Coordinator



Partners



Foresta

Agente forestale regionale per il biologico di su
territorio e de s'ambiente de su Sardegna
Agente forestale regionale per lo sviluppo del
territorio e dell'ambiente della Sardegna
SardegnaForeste



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