

## M4: Solution for the Papermaking Production Puzzle

### Forest Owner: B1

You own a forest in Sweden, Finland, Germany, Spain or Portugal that is sustainably managed, and you produce virgin wood for the paper industry.

- » Which step in the production process precedes your production step? **None. Wood is one of the two starting points of the Papermaking Process.**
- » Where does your product go? **You sell your wood which is then de-barked and chipped.**
- » Which is your correct position in the papermaking process? **B1**
- » What else is needed for your production step (e.g. manpower, energy, water, chemicals,...): **Manpower, energy, chain saws, tractors and other machines to cut down the trees and log them out of the forest.**

### Woodyard manager: B2

You buy wood and process raw logs into boards and beams. You either sell high-quality wood boards and beams to traders and send leftovers to pulp mills or you buy wood of a lesser quality and sell all of it to pulp mills.

The European paper industry primarily sources wood from within Europe, with over 90% coming from native EU forests and plantations, while only a small percentage is imported from outside the continent.

- » Which step in the production process precedes your production step? **Production of wood in forests.**
- » Which step in the production process follows? **Pulping**
- » Which is your correct position in the papermaking process? **B2**
- » What else is needed for your production step (e.g. manpower, energy, water, chemicals,...): **Manpower, energy, saws and other machines to cut the wood.**

### Pulp mill manager: B3

In your pulp mill mechanical and chemical pulping of wood takes place. Approximately 90 percent of the wood comes from European countries such as Sweden, Finland, Germany, Spain or Portugal. Approximately 10 percent of wood for pulp in Europe comes from outside the continent, including Canada, the United States, China, and South America, especially from timber plantations.

- » Which step in the production process precedes your production step? **De-barking and chipping.**
- » Which step in the production process follows? **Cleaning**
- » Which is your correct position in the papermaking process? **B3**
- » What else is needed for your production step (e.g. manpower, energy, water, chemicals,...): **Manpower, energy, water, chemicals**

**Manager of a cleaning facility: C1**

You are the manager of a cleaning facility. The cleaning of the wood pulp is either done in a pulp mill or in a paper mill. You try to re-use chemicals, you need to clean the water and use as little energy as possible.

- » Which step in the production process precedes your production step? **Mechanical and chemical pulping.**
- » Which step in the production process follows? **Diluting, pressing and drying the wood pulp as part of paper making.**
- » Which is your correct position in the papermaking process? **C1**
- » What else is needed for your production step (e.g. manpower, energy, water, chemicals,...): **Manpower, energy, water, chemicals.**

**Manager in a paper mill responsible for diluting, pressing, drying: C2**

You manage part of a paper mill. Here, the wood pulp is diluted with 100 times its weight and spread on the wire section. The fibre liquid is then run through the machine where it is pressed and dried. You try to re-use chemicals, you need to clean the water and use as little energy as possible.

- » Which step in the production process precedes your production step? **Cleaning.**
- » Which step in the production process follows? **Coating, calendering and finishing**
- » Which is your correct position in the papermaking process? **C2**
- » What else is needed for your production step (e.g. manpower, energy, water, chemicals,...): **Manpower, energy, water, chemicals.**

**Manager in a paper mill responsible for coating, calendering and finishing: C3**

You manage part of a paper mill. Here, coating, calendaring and finishing take place. During the process of coating, coating color containing pigments, binding agents and various additives is spread onto the paper surface. Then the paper can be calendered. A calender is a device with two or more rollers through which the paper is run. The rollers press the paper and heat gives the paper its smooth look and feel.

- » Which steps in the production process precedes your production step? **Diluting, pressing, drying.**
- » Which step in the production process follows? **None**
- » Which is your correct position in the papermaking process? **C3**
- » What else is needed for your production step (e.g. manpower, energy, water, chemicals,...): **Manpower, energy, coating colour and other chemicals.**

**Manager of a paper recycling facility: A1**

You are the manager of a paper recycling facility. Paper for recycling is dissolved into pulp to separate the component fibres. The ink is then removed from the pulp.

- » Which steps in the production process precedes your production step? **This process is not depicted in the diagram but it means collecting and sorting of used paper.**
- » Which step in the production process follows? **Cleaning**
- » Which is your correct position in the papermaking process? **A1**
- » What else is needed for your production step (e.g. manpower, energy, water, chemicals,...): **Manpower, energy, water, chemicals.**