Decarbonising transport and logistics chains in Europe?
The forest fibre and paper industry assessment and perspectives
Discussion paper
The European forest fibre and paper industry supplies 23% of the global market. Our sector leads the way:

- It employs over 175,000 people in more than 900 mills and 495 companies and generates an annual turnover of €75 billion.
- The sector mainly uses local raw materials:
  - 83% of virgin and recycled fibres used are sustainably sourced in Europe.
- Over 20% of European pulp and paper production is exported.

Pulp and paper producers are part of the much larger forest-based industry sector, which overall represents about 7% of EU manufacturing GDP.
CEPI presented in February 2017 a review of its 2050 roadmap scoping the pathways, transformative investments and policy frameworks required for realising a 80% reduction of Greenhouse Gases (GHG) emissions and a 50% growth in the added-value delivered by the forest-fibres and paper industries in Europe.

CEPI’s 2050 roadmap takes into account the emissions from the transport and logistics chain of industry. Emissions are estimated at 5 million tonnes of CO₂ in 2015, the equivalent to 1.5 billion litres of diesel and accounts for roughly 10% of overall emission in the forest fibre and paper industry. The 2050 roadmap trajectory implies a GHG emissions reduction by 4 million tonnes in the next 35 years.

Such a reduction will be particularly challenging in the highly complex logistics chain of the forest fibre and paper industry. Indeed, raw materials and product deliveries in the European forest fibre and paper industry total approximately 350 million tonnes and cost 7.5 billion euros annually.

Furthermore, the raw material supply chains from forests for raw wood and collection points for recycled paper are more scattered than in many other industries and mostly rely on road transport. In addition, finished products need to be delivered with short lead times to final customers across Europe. As a result, transportation represents a significant share in the cost of our final products and cost-efficient logistics are a central topic for forest fibre and paper companies.

Developed by CEPI members’ transport experts, this paper explores the possible pathways for a cost-efficient reduction of the industry transport and logistics chain emission towards 80% by 2050. It is intended to provide a sector specific illustration of the transport decarbonisation challenges and opportunities, which has now become particularly relevant in the context of the European Union’s debate on low-carbon mobility and its recently launched EU Mobility Package initiatives of 31 May and 8 November 2017.

### CO₂ emissions reduction and decarbonisation pathways for the European forest fibre and paper industry by 2050

<table>
<thead>
<tr>
<th>Year</th>
<th>Emissions (Million Tonnes CO₂)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>60</td>
</tr>
<tr>
<td>2015</td>
<td>49</td>
</tr>
<tr>
<td>2050</td>
<td>12</td>
</tr>
</tbody>
</table>

#### 2015-2050 pathways for decarbonisation

- **Transport**
  - Direct emissions: -7%
  - Purchased electricity: -11%

- **Energy efficiency**
  - Demand-side flexibility
  - Emerging & Breakthrough
  - Fuel switch

#### Source: Gaia 2016

1 CEPI Investing in Europe for Industry Transformation - 2050 Roadmap to a low-carbon bioeconomy

http://www.cepi.org/node/21250
Pathways to **Advance Transport Decarbonisation**

82% of the forest fibre and paper industry’s raw materials and products are today transported by road in Europe. The local sourcing of raw materials and customers’ delivery requirements will maintain road transport as the dominant transportation mode in the future. Lowering road transportation emissions is therefore the central focus for the decarbonisation of transport and logistics chain.

Four available pathways to decarbonise forest fibre and paper industry transport have been identified with a combined potential of 60% emissions reduction by 2050, while R&D pathways needs to be pursued to bridge the gap with a deeper 80% reduction.

These pathways are outlined below and will need to be supported by an enabling policy framework, which is discussed in the next section.
1. Vehicle fuel efficiency improvement

The progress in vehicles fuel efficiency is often grossly underestimated and yet presents the most significant potential for emissions reduction.

The organisation Transport & Environment estimates that truck fuel efficiency can improve up to 40% by 2030. Volvo and Daimler have, for example, introduced super-truck concepts that consume only 19 litres of diesel per 100 kilometres – compared to today’s average of 33 litres per 100 kilometres.

The fuel efficiency of trucks and subsequent carbon emissions depend on various factors. Technical factors include e.g. vehicle design, vehicle size and weight and power train. Other factors, such as adaptation of fuel saving driving techniques, infrastructure quality and speed limits are anticipated by the automotive industry to improve fuel efficiency.

Improving truck fuel efficiency is the biggest single candidate for decarbonisation. Additional incentives for fuel efficiency improvement (such as CO₂ emission standards for heavy-duty vehicles) will be essential to achieve the necessary transition. Our industry’s big transport volumes should help to establish cooperation with logistics service providers and truck manufacturers to drive for development in this area.

Based on automotive industry estimates, a 30%, at least, carbon reduction potential can be forecasted through fuel efficiency improvement of trucks by 2050.
2. Fuel shift

In addition to increased fuel efficiency, emissions can be reduced by the use of alternative fuels and energy sources. The most prominent alternatives are electricity, liquefied and compressed natural gas, biogas, advanced biofuels and renewable diesel. Hydrogen is also an emerging alternative as a power source for trucks.

The forest fibre and paper industry is a producer of renewable energy such as electricity production on site from pulp and paper mills. There are also increasing possibilities, and industrial examples are already operating, to produce advanced biofuels and biogas from waste, harvesting residues and industrial side streams. The advantage of renewable diesel or advanced biofuels is that they do not require any changes in vehicle technology. However, raw materials for their production are not available in unrestricted amounts.

The use of electric or hybrid trucks will be possible provided that battery technology develops favourably and that an adequate charging infrastructure develops in Europe. The use of electricity on short distance transport could be used to transport raw wood within a limited radius from the mill. Electricity may be an option in the last-mile distribution of products. There is also on-going research on electric road systems, e.g. a catenary system of overhead wires for hybrid trucks may be another alternative to reduce the use of fossil fuels in trucks.

Hydrogen fuel cells and natural gas are also alternatives in transport. Fuel cells are an emerging technology in heavy duty vehicles and a truck with a 1,200 mile operating radius is planned to be introduced in 2020. The use of natural gas is increasing in transport, though further technical development is required to solve issues such as engine power and methane leakage.

Several fuel shift options to less carbon-intensive and renewable fuels are already available or in development and could provide an additional emission reduction potential in the forest fibre and paper industry of at least 10% by 2050.³

³ ACEA Reducing CO2 from trucks: Progress in practice - Third-party assessment
http://www.acea.be

From advanced biofuels to electricity or hydrogen-cells, fuel shift options can additionally help reduce emissions by 10%
3. Logistics efficiency

The forest fibre and paper industry is constantly improving its logistics efficiency to increase customer service and decrease costs. Therefore, the possibility of a substantial improvement in logistics efficiency is low. However, there are certain external factors that can help improve efficiency, the most prominent being transporting higher unit loads, getting rid of congestion and waiting times, intermodal traffic and making railway transport more efficient and reliable.

Higher unit loads decrease the number of trucks on the road and reduce emissions per transported and delivered tonne. According to the automotive industry, increasing of unit loads has a 7.5% saving potential on its own and experiences from Sweden and Finland are even higher. The possibility of increased weights and dimensions of trucks is therefore a clear enabler for decarbonisation. Allowing more weight overall and in cross-border trips across the EU has a high emission saving potential. Our industry has positive experience in the use of bigger trucks for example in Finland (76 tonnes from 1 October 2013) and Sweden (64 tonnes and 74 tonnes from 1 July 2017). In Finland, also test permits for high capacity transport vehicle combinations (HCT) of over 76 tonnes have been allowed. In raw wood transport the size of HCT combinations varies from 84 to 104 tonnes. The initial results from the mass increase and HCT pilot projects in Finland show that depending on the vehicle size, the savings in fuel consumption per transported tonne compared with the earlier 60 tonne combinations can amount to even 20%. Further trials and authorisations for bigger and heavier trucks in other European countries should be encouraged. It is also key that, as a first step, a minimum gross weight of 44 tonnes is allowed in all countries, including cross-border traffic.

Getting rid of congestion and waiting times can help decrease emissions. This question is addressed under digital solutions and infrastructure.

Train transport emissions are low when the locomotives use low-carbon electricity or fuel. However, rail transport is today often too inflexible, unreliable or more expensive than road transport, especially due to additional handling and warehouses needed in the supply chain because final customers are not normally directly connected by rail. Transit times of rail transport are also longer and less accurate than those of direct truck deliveries. These inefficiencies drive volumes from rail to road. Further liberalisation of rail transport is necessary to create more competition. Removal of technical barriers and restrictive policy measures are required to make train transport a more attractive solution for industry transport, including options for intermodal deliveries, for example trailers on trains.

The emission reduction potential from increased logistics efficiencies in the forest fibre and paper industry could be of 10% if basic conditions and policies were in place.
4. Digital solutions

Digitalisation of the transport and logistics chains are rapidly developing. They act as enabling solutions and support decarbonisation, especially through digitally assisted driving, dynamic route planning and digital platforms.

Solutions that support fuel efficient driving behaviour have proven to be successful in saving fuel. There are experiences of such systems decreasing truck operating costs by up to 30%, of which a large portion comes from decreased fuel consumption. Trials such as truck “platooning” where a fleet of trucks follows a lead truck automatically at a short distance have resulted in fuel savings of 10%. These solutions have also a potential to decrease congestion on highways.

Dynamic route planning will help to avoid congestion and minimise driving distances. More predictable transport flows through better real-time information on traffic conditions, information on alternative routes and better track-and-trace tools will help to improve transport efficiency and effectively decrease emissions.

Digital platforms will play an important role as well. They are created to aid in maximizing payloads and capacity utilisation, identifying return cargos and cargo bundling opportunities and to enhance multimodal transport. Better connectivity of trucks, trains and containers with the infrastructure can improve routing, reduce congestion and at the same time increase reliability, safety and efficiency.

Digitalisation of transport and logistics chains is still an unchartered opportunity. By 2050, there will certainly be solutions that are impossible to predict today. The decarbonisation potential from advanced digitalisation could be at least 10%.

---

4 ERTICO study on ITS for Commercial Vehicles, supported by ACEA
http://erticonetwork.com
5. R&D, integration and innovation deployment

Achieving an additional 20 percentage points of emission savings in the transport sector compared to the EU 60% emission reduction potential outlined in this document will require significant research and development and integration of the new technologies in today’s and tomorrow’s transport and logistics chains.

Technology change is accelerating in all sectors and will transform the transport industry. Without speculating on technology breakthrough over the next 30 years, the challenge of advancing R&D and deploying effectively “on the road” new technologies is discussed in the next section.
Policies Implications and Needs

The emissions savings outlined in this document **will not materialise if they are not supported by enabling policies**. In particular 5 medium to long-term measures are required to enable the uptake of low carbon emissions transport, notably:

1. **Decarbonisation driven modal policies** to ensure fuel efficiency improvement of trucks, including increased truck weights and dimensions.

2. **Harmonised rules and regulations** to support fluid logistics across the EU.

3. **Physical and data infrastructure development** to enable a lower-carbon movement of goods in Europe.

4. **Digital Single Market** to ensure all the potential of digitalisation can be exploited.

5. **Adequate focus on transport decarbonisation in the EU R&D roadmap**.
1. Decarbonisation-driven modal policies

Trucks will remain the main means of transport and fuel efficiency improvement has already the highest decarbonisation potential for road transport. Supporting environmentally efficient trucking is therefore the most obvious area where the EU can drive efficient decarbonisation of transport and logistics chains.

Policy enablers should help trucks to become more sustainable rather than introduce restrictive policies for trucks to drive transport from road to rail. Road taxation is an example of counter-productive measures. In absence of efficient and practical alternatives, it does not enhance the use of other transport modes.

Charges or taxes will certainly increase transport costs, but it is less certain that they will create the desired environmental benefits. It can also impact the financial capacities of logistics and transport operators while significant investments will be required to modernise and adapt fleets.

More fundamentally, to unlock the full potential from range of options available or foreseen to rapidly advance transport decarbonisation it will be key to avoid policies narrowly discriminating road transportation vs. other modes.

2. Harmonised EU rules and regulations

Differences in national legislations and rules across the EU restrain fluid transport and the ability to use transport modes in the most optimal and sustainable way. National cabotage restrictions or different technical standards in rail are good examples of such negative legislation and rulings.

Completion of the EU single market for transport and convergence of standards would enable full integration of transport and logistics. National cabotage restrictions limit possibilities to maximise truck capacity utilization and should therefore be completely withdrawn. This will enable truck companies to decrease empty loads and remove extra trucks from the roads. The maximum vehicle weights and dimensions across Europe will need to be increased for road transport including cross-border traffic.

Railway operators need to be more competitive, reliable and cost-efficient. The current inflexibility and too often relatively low reliability of rail transport drives volumes from rail to road. Instead of enforcing utilisation of railways through e.g. introducing road charges, policy making needs to support railways to become a true competitor with road transport. This will happen by ensuring through legislation that national barriers are removed to create a single European railway system with uniform standards and regulation, as well as to encourage intermodal solutions.
3. Infrastructure development

The identified decarbonisation opportunities will not materialise if the European traffic and communications infrastructures do not enable them. The use of fuel efficient trucks requires road infrastructure can accommodate the traffic otherwise limiting efficiency gains due to congestions or poor conditions.

Most infrastructure development projects are carried out at national level, without a wider European perspective. Investments for modernising key infrastructure should be coordinated and co-funded at the EU level. All income from infrastructure charges should be used for improving logistical systems and infrastructure (earmarking).

Some fuel shift options will also require investments in distribution network. Electric trucks will require enough charging locations and capacity. Electric road systems will require overhead wires and electrical distribution infrastructures. The use of gas or biogas, similarly, require dedicated distribution network for fuelling gas driven trucks.

The European rail network (tracks and systems) and its capacity need to be developed to accommodate a truly Europe-wide uniform railway service. EU policies support so that railway transport becomes a realistic competitor to road transport.

Digitally assisted driving, dynamic route planning and digital platforms all require data transmission capabilities and capacities that are not yet commonly available today. An efficient data transfer and management infrastructure is one of Europe’s future critical success factors.

4. Digital Single Market

Digitalisation will increase data management requirements in all sectors and not only for transport. The creation of a fully functioning Digital Single Market will be the key to enabling digital solutions in transport. Whether digitally assisted driving, dynamic route planning or digital platforms, all digital solutions will require an enabling environment for access and use that do not exist today.

There is also a lack of interoperability of systems across countries and different modes of transport. Reasons for such interoperability issues are, amongst others: different standards across countries, differences between electronic documents per mode and per country, legal obstacles and uncertainty related to cybersecurity. Policies will need to help unify standards, harmonise electronic documentation, enable digitally assisted and automated driving and enable efficient transfer of information with 5G – to name a few.
Transport at large is a major economic sector and accounts for approximately 25% of carbon dioxide emissions within the EU. It will be essential that transport and logistics chains decarbonisation is one of the key missions for the future EU R&D policy.

Besides the natural focus policy-makers (and the general public) place on the “car of the future”, R&D initiatives must address “the trucks and logistic chains of the future”. Relevant funding needs to be allocated to innovation for development of truck fuel efficiency, adaptation of alternative fuels and power sources in the transport sector, plus infrastructural and digital solutions to enhance logistical efficiency. Financing of innovation by the future R&D Framework programme and of their deployment through European Investment Bank (EIB), Connecting Europe Facility (CEF) and European Fund for Strategic Investments (EFSI) will clearly need to be reinforced.
Conclusion

The European forest fibre and paper industry envisions itself at the forefront of a low-carbon circular bioeconomy in which renewable raw materials are replacing fossil resources and are effectively “kept in the loop”.

As outlined in CEPI’s “2050 Roadmap”, the pathways to reduce greenhouse gas emissions by 80% while creating 50% more added-value, imply addressing emissions from the transport and logistics chains.

With this paper, the European forest fibre and paper industry aims at illustrating to stakeholders engaged in the debates on low-carbon mobility the conditions for the cost-efficient transformation of a complex transport and logistic chain.

Based on the review of industry experts, a 60% decarbonisation by 2050 in the sector’s transport and logistics chain would be possible with current measures and technology developments provided that infrastructure and enabling policy frameworks are in place.

An additional 20% reduction of transport and logistics GHG emissions is very challenging and would notably require a step change in innovation and technologies as well as in policies for their deployment by 2050. This also highlights that there is no silver bullet for decarbonising Europe’s transport and logistic chains. This challenge is heightened by differences in geography, infrastructures and logistic chains in Europe. Therefore, the mix of solutions and the pathways to implement them will have to be framed in a regional perspective.
Contact

CEPI aisbl
Sylvain Lhôte
Director General

Metka Čavka Luciani
Public Affairs manager

www.cepi.org
Confederation of European Paper Industries
Avenue Louise 250, box 80
B-1050 Brussels
Belgium
Tel: +32 2 627 49 11
E-mail: mail@cepi.org

Photographs ©
StoraEnso & Shutterstock