



Clean Industrial Deal should capitalize on the full benefits of the forest-based bioeconomy

Recommendations by the Natural Resources Institute Finland

In her Political Guidelines for the new European Commission, Ursula von der Leyen emphasizes the urgent need to simultaneously decarbonize and industrialize our economy. The Clean Industrial Deal aims to build a more circular and sustainably competitive economy while boosting productivity. European forests and forest-based bioeconomy are key to achieving these goals.

The European Union should:

1. Set targets and policies to support production and use of high-value forest-based products.
2. Secure the future growth and resilience of European forest resources.
3. Guide clean energy projects to areas of lower priority for forest-based services and livelihoods.

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Background



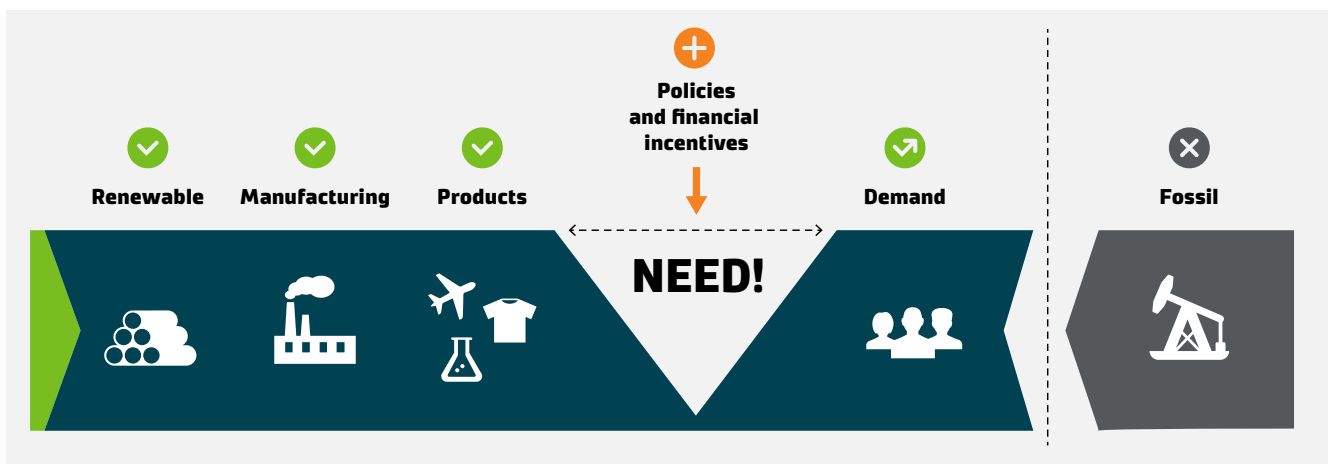
The European forest-based bioeconomy supports the Clean Industrial Deal by promoting a shift to a more sustainable pattern of production and substituting fossil-based materials while also preserving key forest ecosystem services such as biodiversity and carbon sequestration. This includes generating higher value from forest resources at current harvest levels, promoting future-oriented active forest management,

and providing incentives to ensure the capacity of forests to grow and adapt to the future climate. It also involves integration of clean energy projects into broader land-use planning.

Achieving all these goals requires a multi-dimensional approach in which scientific research, technological innovations, and policy support are crucial.

Goal 1

Set targets and policies to support production and use of high-value forest-based products.



The Clean Industrial Deal aims to decarbonize the EU's economy by retaining the value of resources for longer and stimulating market demand for high-value materials.

The forest-based bioeconomy plays a crucial role in this transition and contributes significantly to achieving the Net Zero. By adopting circular bioeconomy practices the value chain of the forest sector can be enhanced. For example, cellulose and lignin can be processed into higher-value products such as textiles and chemicals, while also providing biogenic carbon dioxide for use in e-fuels and technological carbon sinks (Arasto et al. 2024, Kohl 2024, Lintunen et al. 2023, Österberg et al. 2024).

Despite this potential, a large proportion of wood is still used for energy. Technological challenges, high production costs, and regulation hinder the emergence of high-value forest-based products (Arasto et al. 2024).

Setting clear targets and incentives for forest-based value-added products will help drive the transition to Net Zero by creating predictability for investors and manufacturers. For example, the 2035 zero-emission target for all new cars could stimulate the development, demand, and scaling of bio-based e-fuels (Figure 1).

Figure 1 To boost demand and scale-up high-value forest-based products as replacements for fossil-based materials, clear targets, policies and financial incentives are needed.

Recommendations:

- Set clear targets for the share of high-value forest-based products in the EU market, including bio-based e-fuels, for 2040.
- Develop financial incentives and subsidies to accelerate the commercialization of high-value forest-based products, from research to market scale-up.
- Integrate high-value forest-based products and their carbon sequestration potential into relevant carbon pricing or offset mechanisms.
- Promote public policies that prioritize forest-based materials in construction, textiles, and energy sectors, to stimulate demand.

Goal 2

Secure the future growth and resilience of European forest resources.

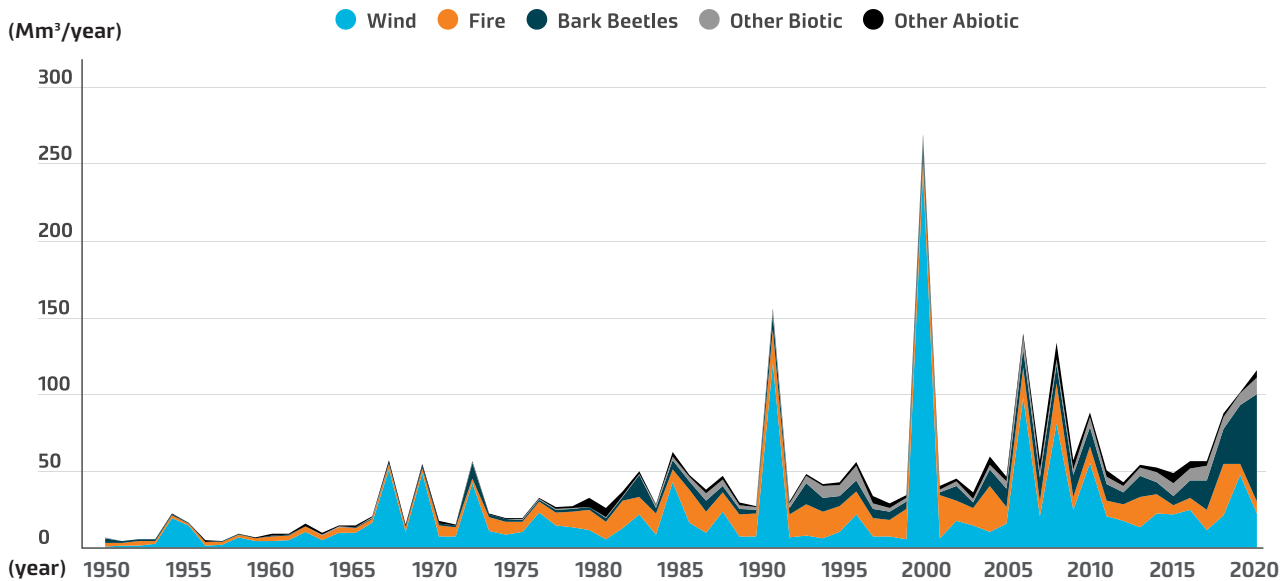


Figure 2 | Total reported damage caused by natural disturbances in Europe between 1950 and 2019. Source: Patacca et al. 2023.

A stable raw material supply is critical to attract investments in the forest-based bioeconomy, which in turn supports the success of the Clean Industrial Deal. Europe has the potential to be more self-sufficient in forest raw materials supply if forest health, growth and ecological sustainability can be ensured by long-term and future-oriented management practices.

Forest resources in Europe have increased steadily since the 1950s, allowing for higher wood removals to meet the demands of population growth and economic development. However, this growth has started to decline. Furthermore, climate change is leading to a decrease in the supply of forest resources due to drought and disturbances caused by storms, fires, and bark beetles (Figure 2, Patacca et al. 2023, Kurttila et al. 2024). It is also noteworthy that increasing demands for the provision of various non-wood ecosystem services and related regulations will have an impact on the future wood supply.

Recommendations

- Strengthen research on forest management regimes and field-based technologies that are adapted to future environmental conditions.
- Support the development of modern tree breeding technologies that produce climate-resilient material suited for future bioeconomy innovations.
- Develop cost-efficient, multifunctional and region-specific forest management strategies to provide diverse ecosystem services and a heterogeneous supply of raw materials.

Goal 3

Guide clean energy projects to areas of lower priority for forest-based services and livelihoods.

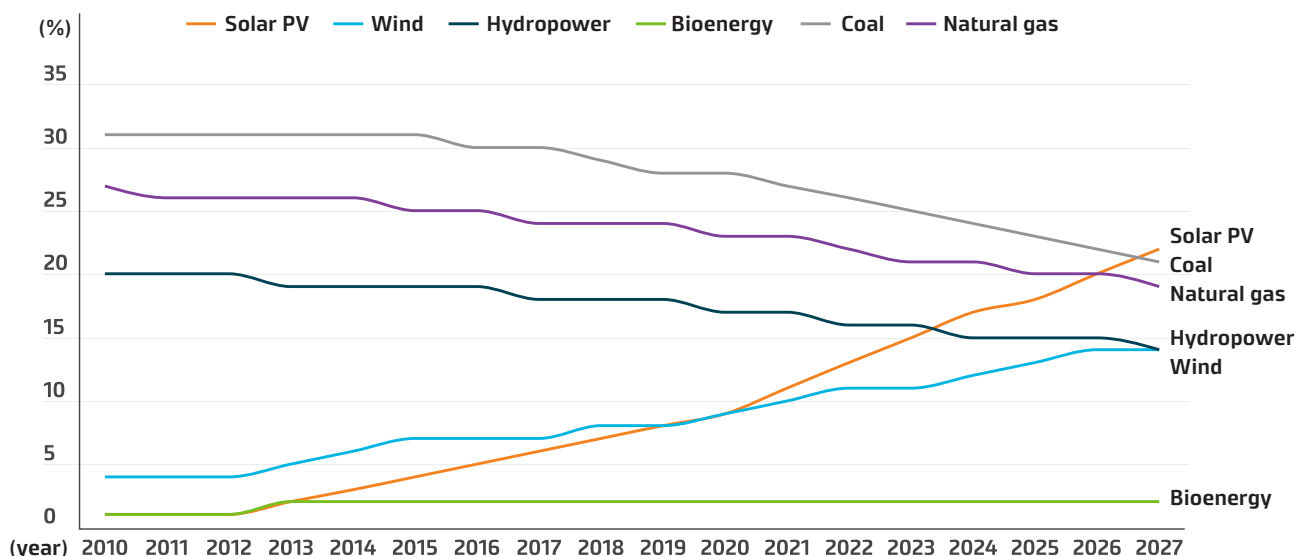


Figure 3 | Share of cumulative power capacity by technology, 2010–2027. Source: IEA 2022.

One of the central goals of the Clean Industrial Deal is to scale up and prioritize investments in clean energy infrastructure and technologies. The EU's revised Renewable Energy Directive sets a target for renewable energy to account for 42.5% of total energy consumption by 2030, up from 23% in 2022.

While expanding clean energy production is critical to the decarbonization process, the rapid growth of wind and solar power can create trade-offs with forest resources, carbon sinks, and biodiversity. Solar and wind power are forecasted to more than double by 2028 compared to 2022 (IEA 2024), and the share of solar power is predicted to exceed that of coal and

natural gas already in 2026 (Figure 3, IEA 2022). Locating wind and solar power projects in forested areas can lead to wildlife displacement, with up to 63% - 72% of birds, bats, and mammals studied being displaced by onshore wind power (Tolvanen et al. 2023).

To increase overall sustainability, it is essential to minimize these trade-offs through integrated renewable energy planning that considers cumulative impacts (Figure 4). This enhances the compatibility of Renewable Energy Directive with the land use for forestry, biodiversity, recreation and other ecosystem services.

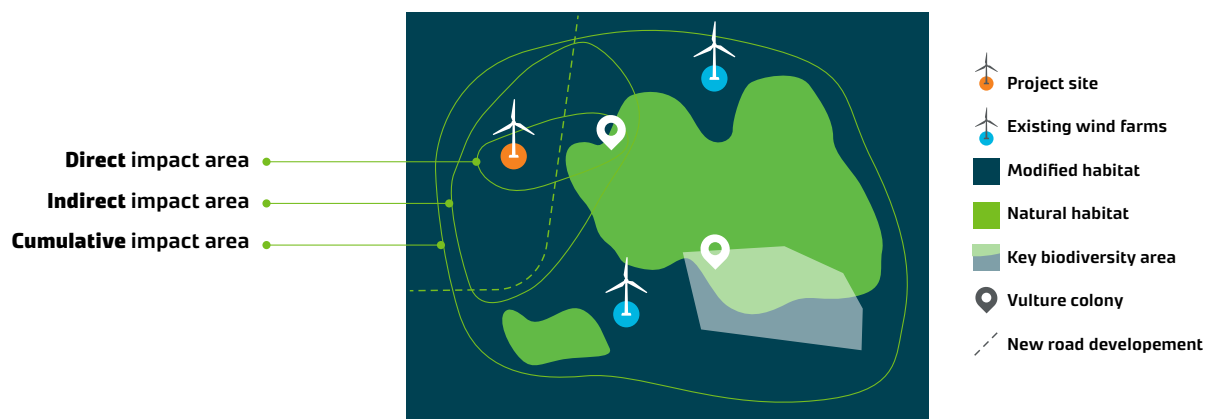


Figure 4 | Direct, indirect and cumulative impacts of onshore wind power. Modified from Bennum et al. 2021.

Recommendations

- Strengthen research on the cumulative impacts of clean energy projects on forest ecosystems, the forest-based bioeconomy, carbon sinks, and biodiversity, and ensure that these findings inform land-use planning and policy decisions.
- Integrate clean energy projects into national and regional land-use planning to assess cumulative impacts and ensure that negative impacts are avoided, mitigated, and if necessary, compensated.
- Develop regulations and financial incentives that prioritize low-value environments, wastelands, or degraded lands for clean energy production, supported by proactive land-use mapping.



Conclusion

European forests and forest-based bioeconomy are essential to the success of the Clean Industrial Deal, providing renewable raw materials for high-value products, while acting as vital carbon sinks, preserving biodiversity, and supporting key ecosystem services. It is important that their role in decarbonizing the economy and boosting sustainable competitiveness is fully recognized and integrated into research, innovation and future policies.

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