

# Biobaserade trafikskyltar för en hållbar trafikmiljö

RenFuel, Södra Skogsägarna, Trafikverket

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The logo for Infra Sweden is a horizontal bar composed of several geometric shapes in shades of yellow, blue, and green. On the left, there is a yellow square containing a blue circle. To its right is a blue shape with a curved top. The central part is a yellow rectangle with the text 'Infra Sweden' in bold black font. This is followed by a green triangle pointing right, a blue triangle pointing left, a yellow triangle pointing right, a blue triangle pointing left, a green triangle pointing right, and finally a blue square containing a green circle on the far right.

**Infra  
Sweden**

# Background and context

- **Traffic sign carriers** (1/3 of the total cost) are usually made of **aluminum** or **glass fiber-reinforced polyester resin**.
- About **10%** of all traffic signs need to be replaced each year  
→ high energy and fossil material consumption.
- For about 10 years, **our partner NPSP** has been developing traffic sign carriers consisting of a **fossil-based polyester resin, reinforced with natural fibers**.
- The polyester resin is the most CO<sub>2</sub>-intensive component, and our aim is to **replace it with a bio-based resin** to develop a **fully bio-based carrier**.



# Project goals and challenges

- To demonstrate that innovative traffic signs, consisting of **fiber-reinforced lignin-based composites**, can be the product of **new value chains** solely depending on **renewable residual streams** from the Swedish forest industry.
- Technical challenges:
  - ❖ **Mechanical resistance** and durability in **outdoor conditions**, according to EN 12899-1.
  - ❖ Foil **adhesion** and **retro-reflective properties** of the foil should be preserved over time (no deformation).
- Sustainability: Estimates for CO<sub>2</sub> footprint, energy and material consumption, economic costs, end-of-life scenarios, work opportunities in Sweden.
- Implementation challenges:
  - ❖ Volume estimates → Technical scale-up (investments)
  - ❖ Implementation cost → business case, feasibility assessment



RenFuel's lignin-based thermosetting resin, Ligniset®

# Value chain and collaborators



Lignin stream from  
pulp & paper industry

Chemical modification  
of lignin into resin

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Fabrication and lab  
evaluation of demo signs

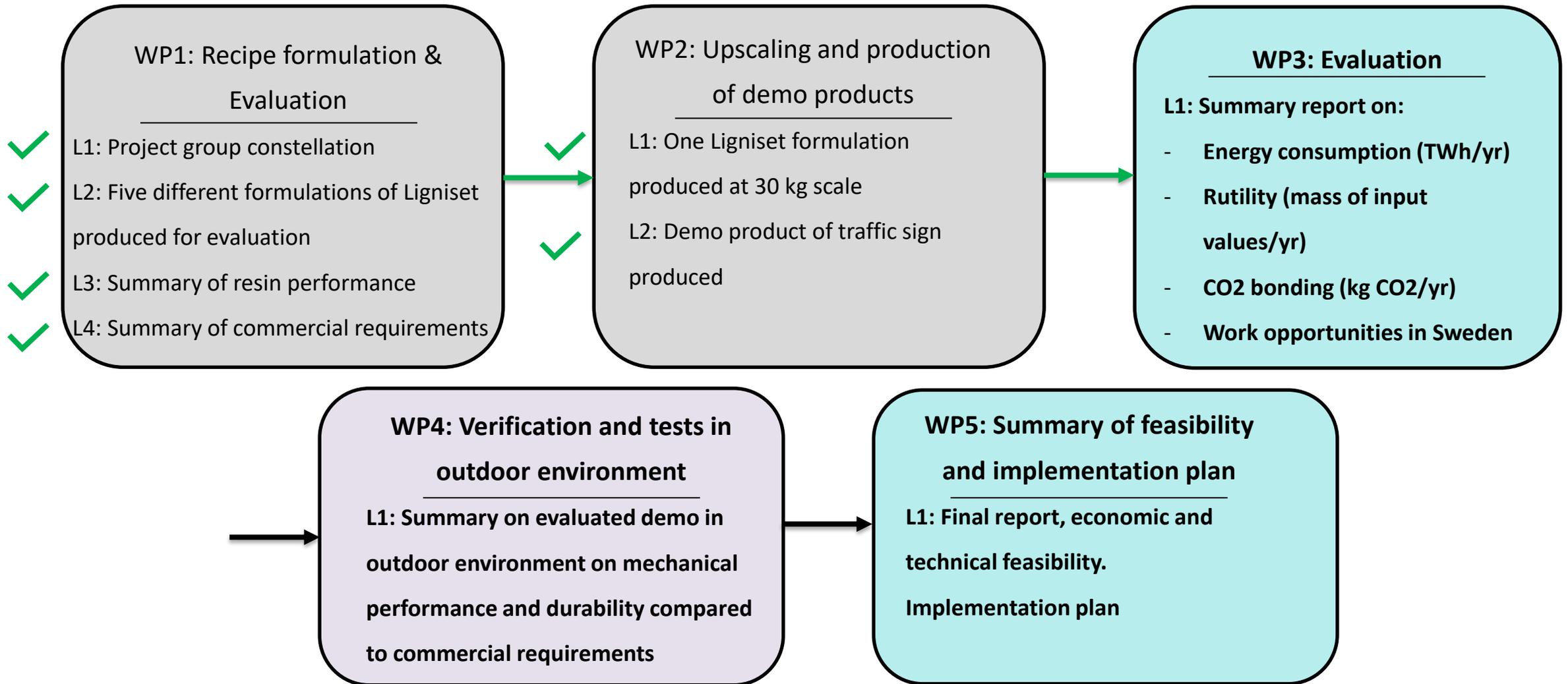


Outdoor installation and  
evaluation of demo signs

Communication with  
stakeholders,  
Implementation strategy



# Project milestones and time plan

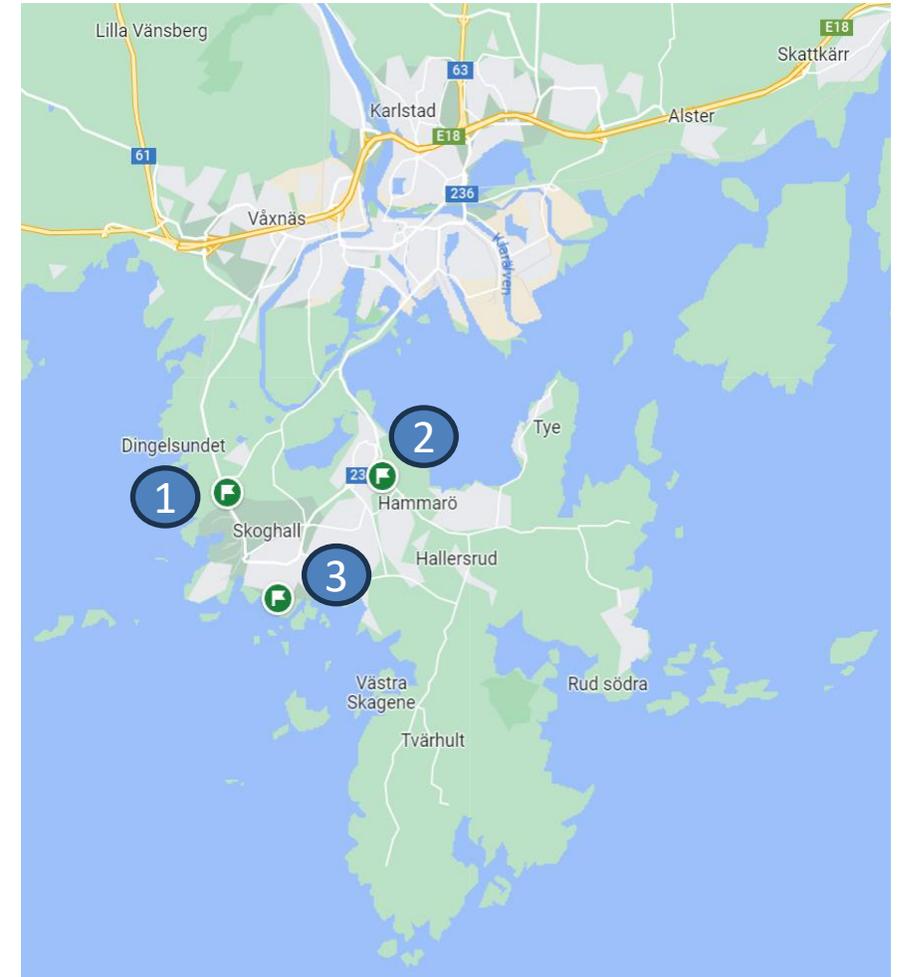
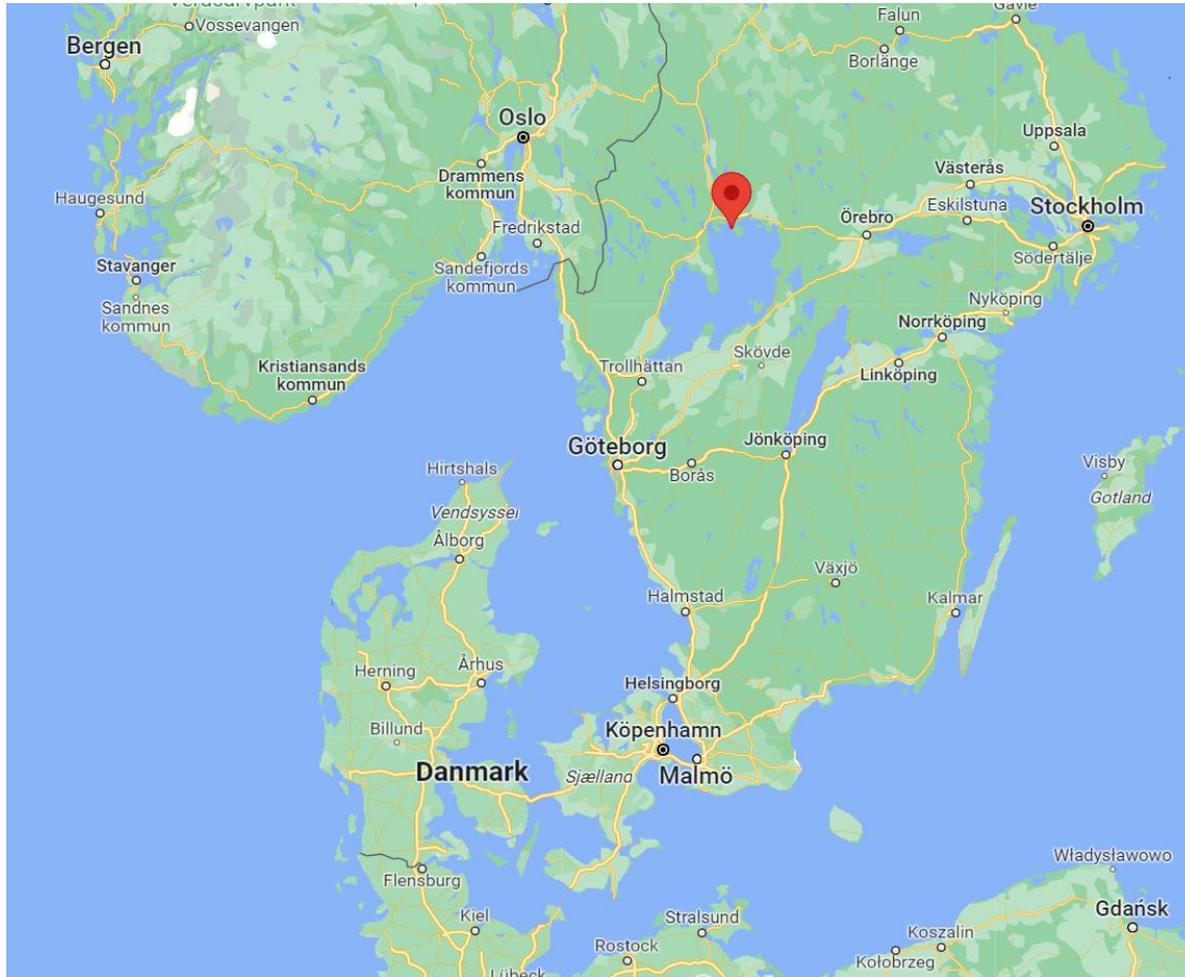


# First round of demo signs



3 specimens for outdoor testing

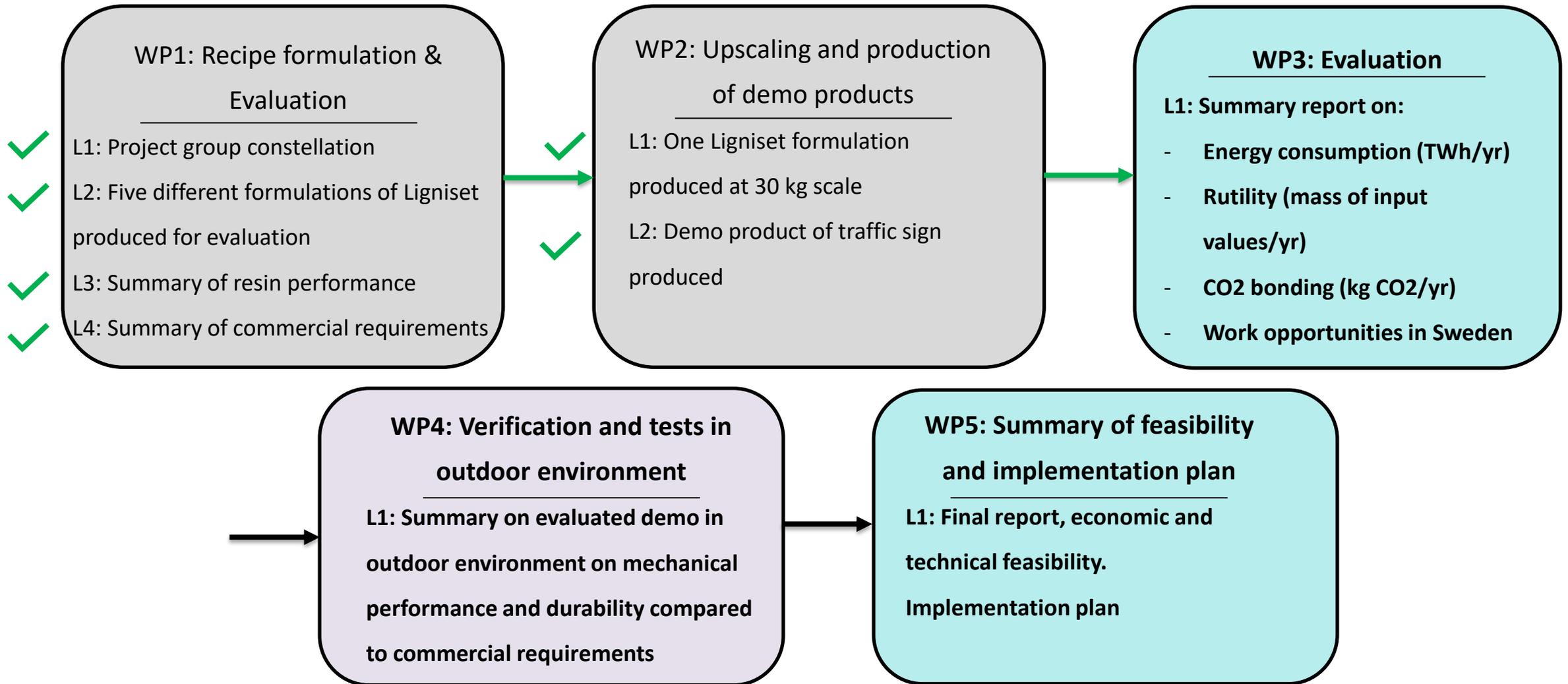
# First round of demo signs





First round  
of demo signs

# Project milestones and time plan



# More lignin-based composites to be developed

- Within the project: a **second generation** of lignin-based resins, expected to be **much stronger**.
- Beyond the project:
  - ❖ Continued collaboration with NPSP to expand our range of **outdoor composites** (outdoor furniture, ...).
  - ❖ Exploration in the field of lignin-based **pavements**.

# Thank you!

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[www.renfuel.se](http://www.renfuel.se)



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The footer features a series of overlapping geometric shapes in yellow, teal, and dark blue. On the left is a yellow square with a teal circle. In the center, the text 'Infra Sweden' is displayed in bold black font on a yellow background. To the right, there is a teal circle and a teal shape resembling a stylized letter 'K'.