Biobaserade trafikskyltar för en hållbar trafikmiljö

RenFuel, Södra Skogsägarna, Trafikverket

April 2021 – Mars 2024

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_2-intensive component, and our aim is to **replace it with a bio-based resin** to develop a **fully bio-based carrier.**

nabasco SIGN
100% Smart & Sustainable

Source: https://nabasco.nl/

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.

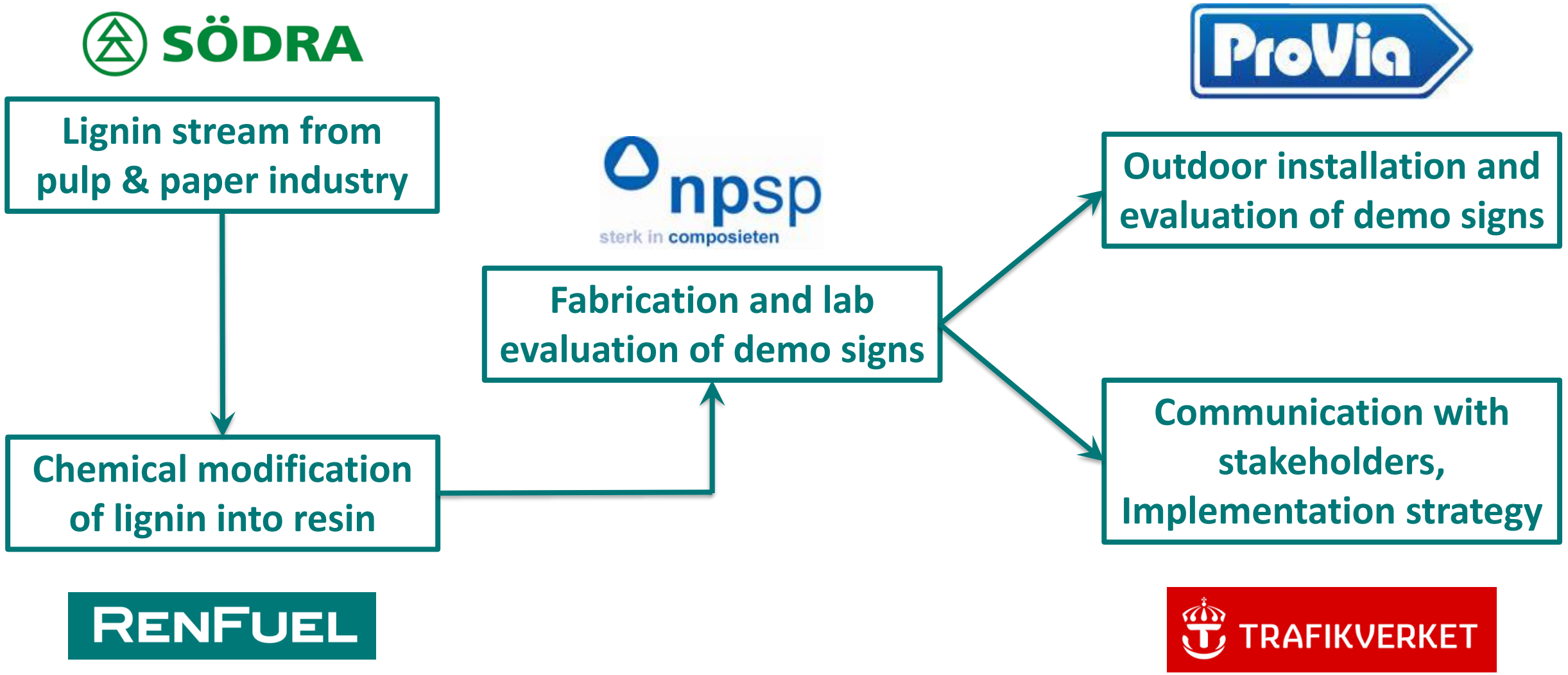
- Technical challenges:
  - **Mechanical resistance** and durability in **outdoor conditions**, according to EN 12899-1.
  - Foil **adhesion** and **retro-reflective properties** of the foil should be preserved over time (no deformation).

- Sustainability: Estimates for CO_2 footprint, energy and material consumption, economic costs, end-of-life scenarios, work opportunities in Sweden.

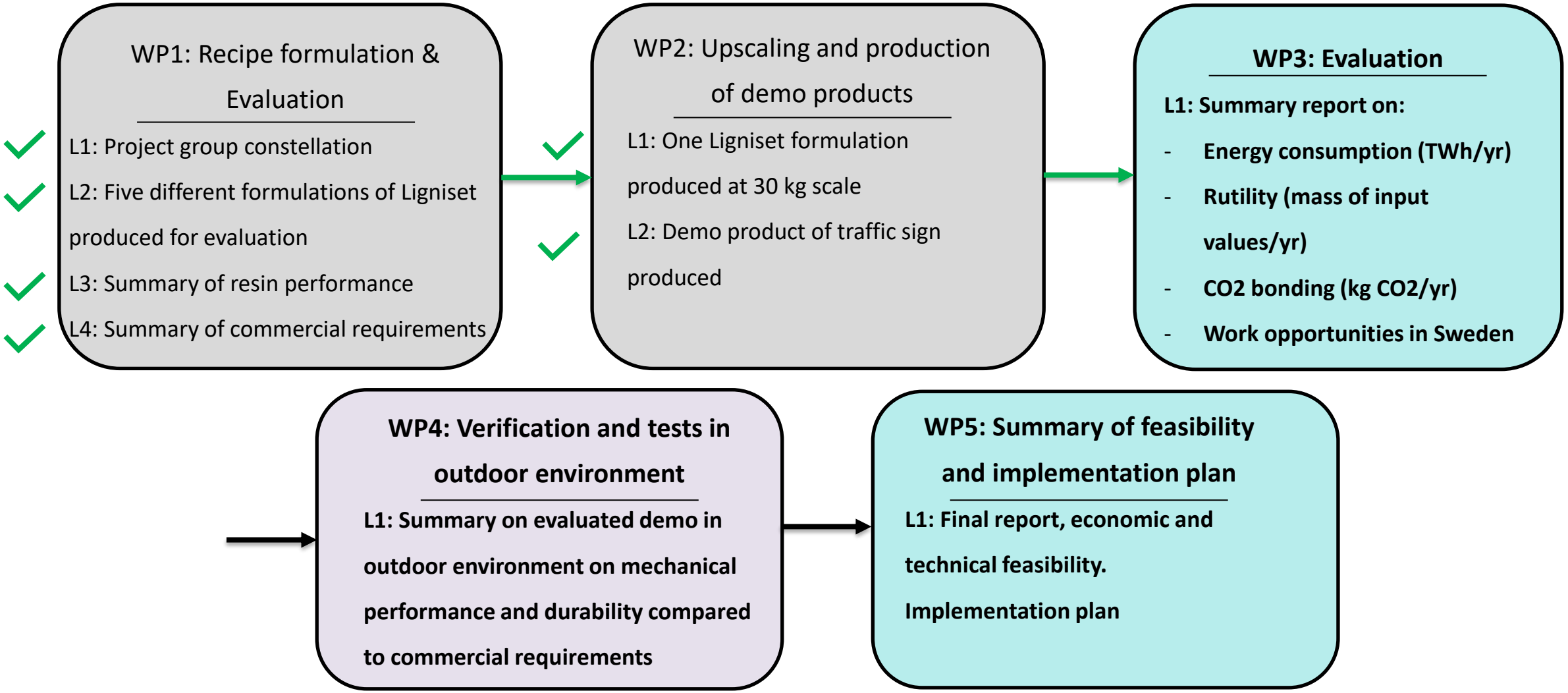
- Implementation challenges:
  - Volume estimates → Technical scale-up (investments)
  - Implementation cost → business case, feasibility assessment

RenFuel's lignin-based thermosetting resin, Ligniset®

Value chain and collaborators



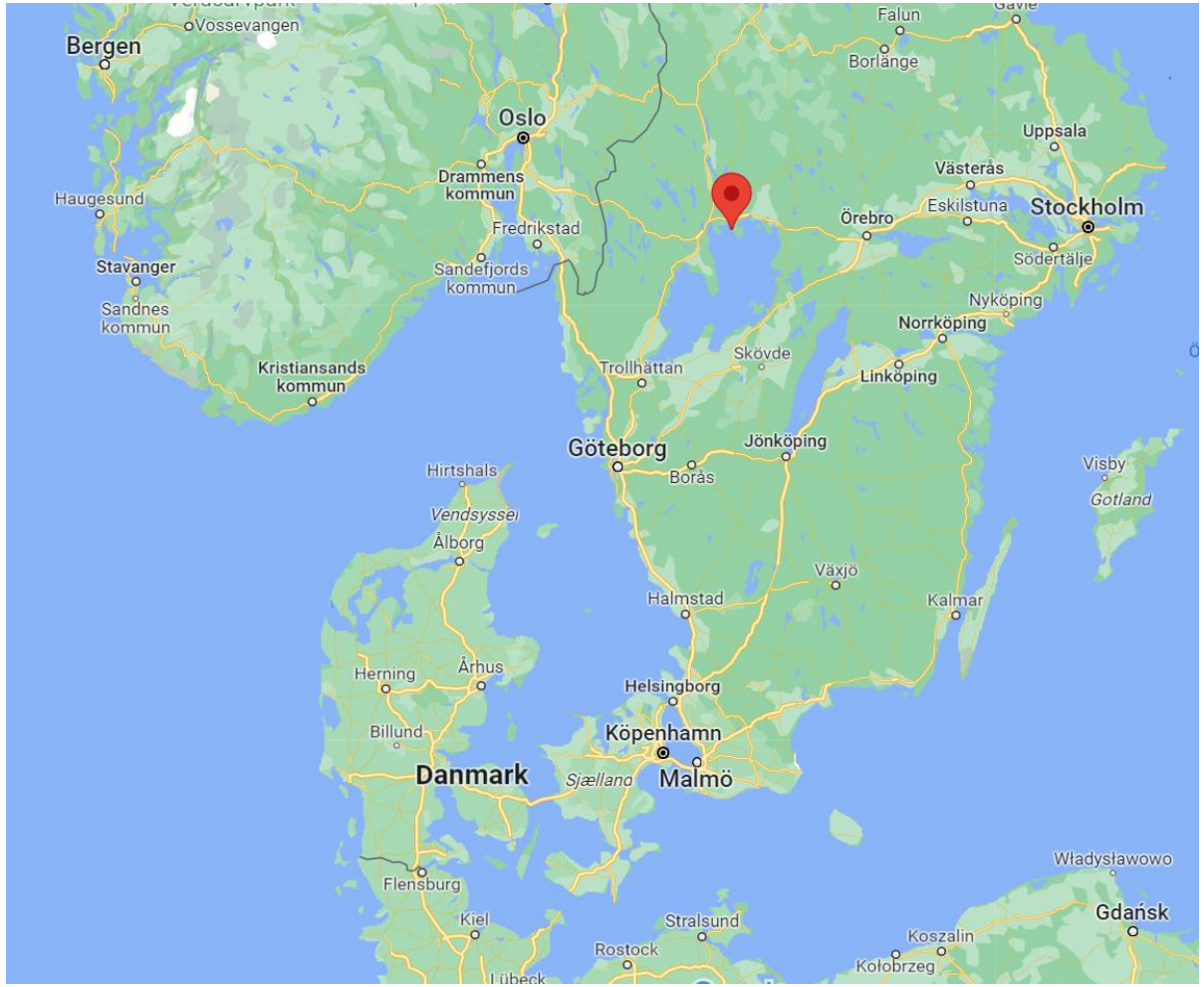
Project milestones and time plan

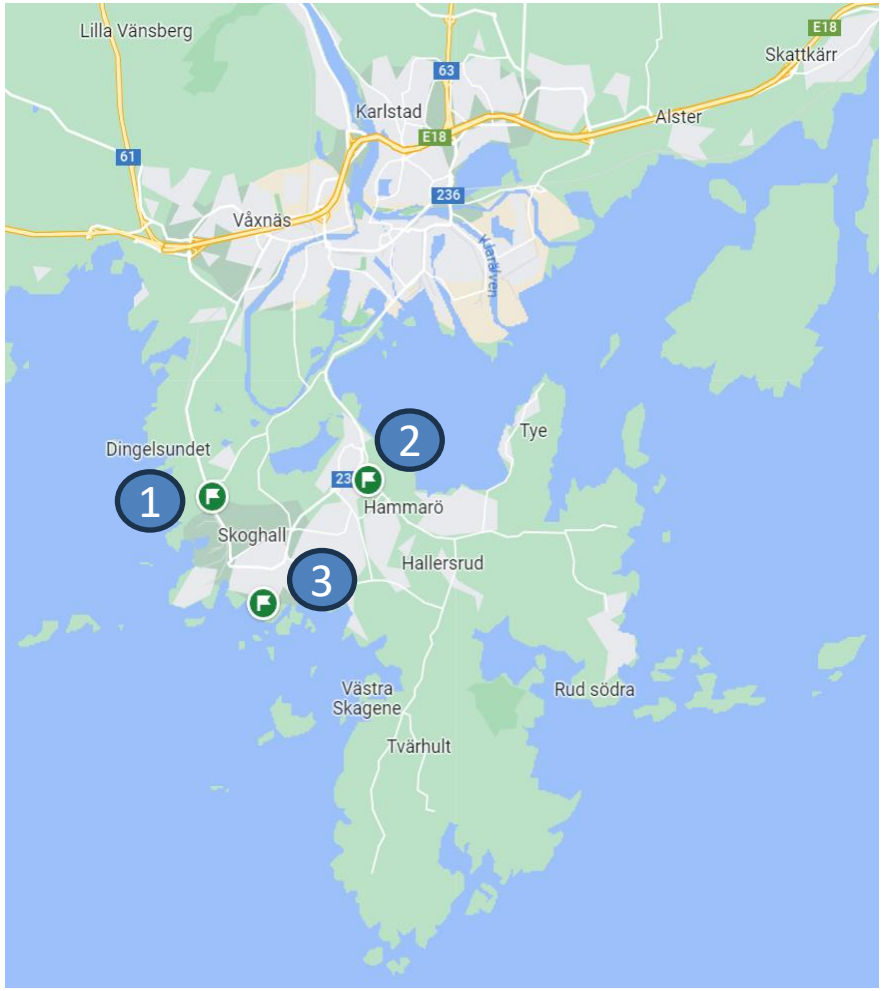


First round of demo signs

3 specimens for outdoor testing

First round of demo signs





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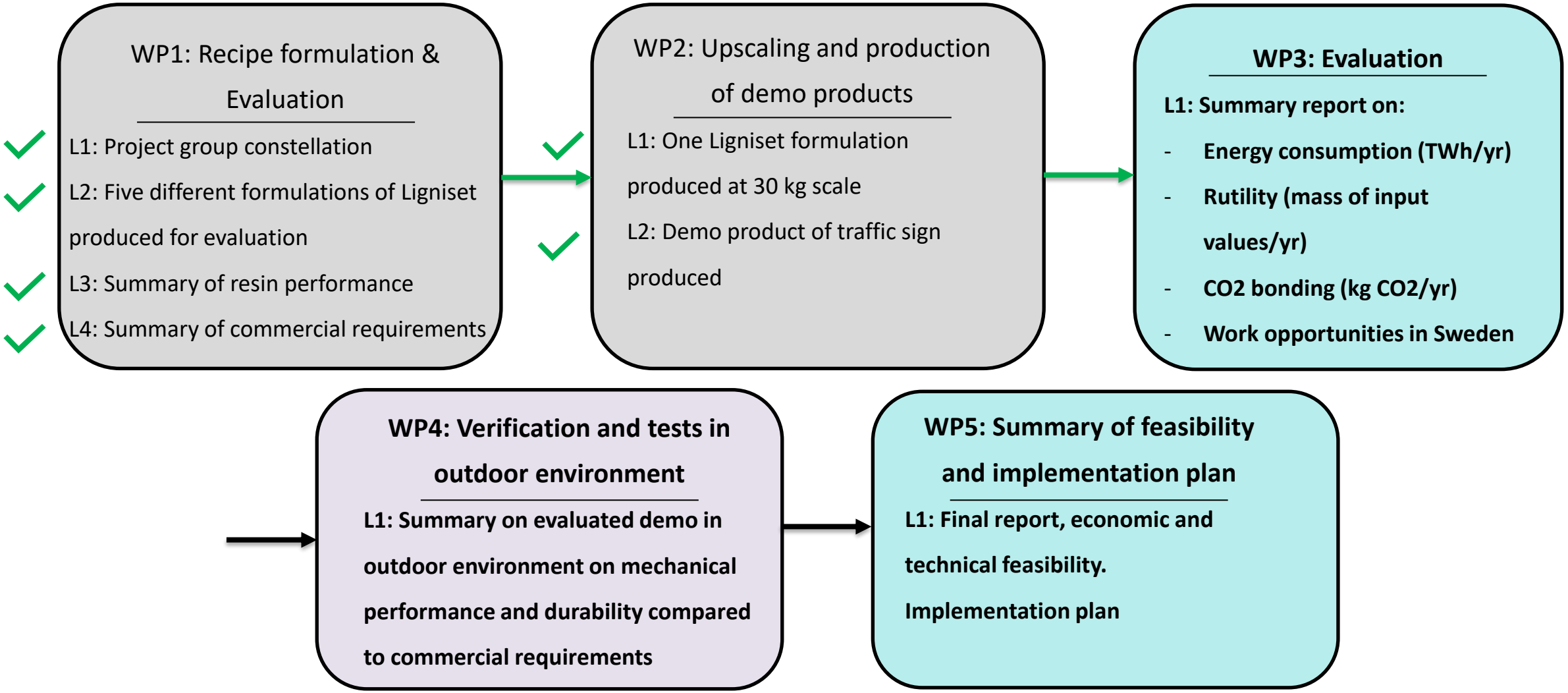

More lignin-based composites to be developed

- 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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