# BIOCARB -4-FOOD

# Extraction and characterization of BIOactives and CARBohydrates from seaweeds and seagrasses FOR FOOD-related applications

**BACKGROUND** Carbohydrates as most important source of food energy are key ingredients for food formulations (thickeners, stabilizers, gelling agents) or providing functional attributes. Seaweeds and sea-grasses are a valuable, under-exploited carbohydrate source, particularly, bioactive compounds such as polyphenols. Current carbohydrate extraction procedures are inefficient in terms of processing time, water and energy use. Remaining biomass (generally more than 50% of the initial material) is used as compost or simply disposed as organic waste.

**EXPECTED RESULTS** BIOCARB-4-FOOD will contribute to improved process efficiency, development of ingredients with high added value from already commercialized seaweed species and from underexploited sources (seagrasses) which can positively impact the competitiveness of seaweed, food and non-food companies at EU scale by a better valorization of raw materials. Extraction products shall serve as food additives or for biodegradable packaging material. Further advantages are the use of seaweeds and following relief for coastal areas.

## Extracted Seagrasses and Algae



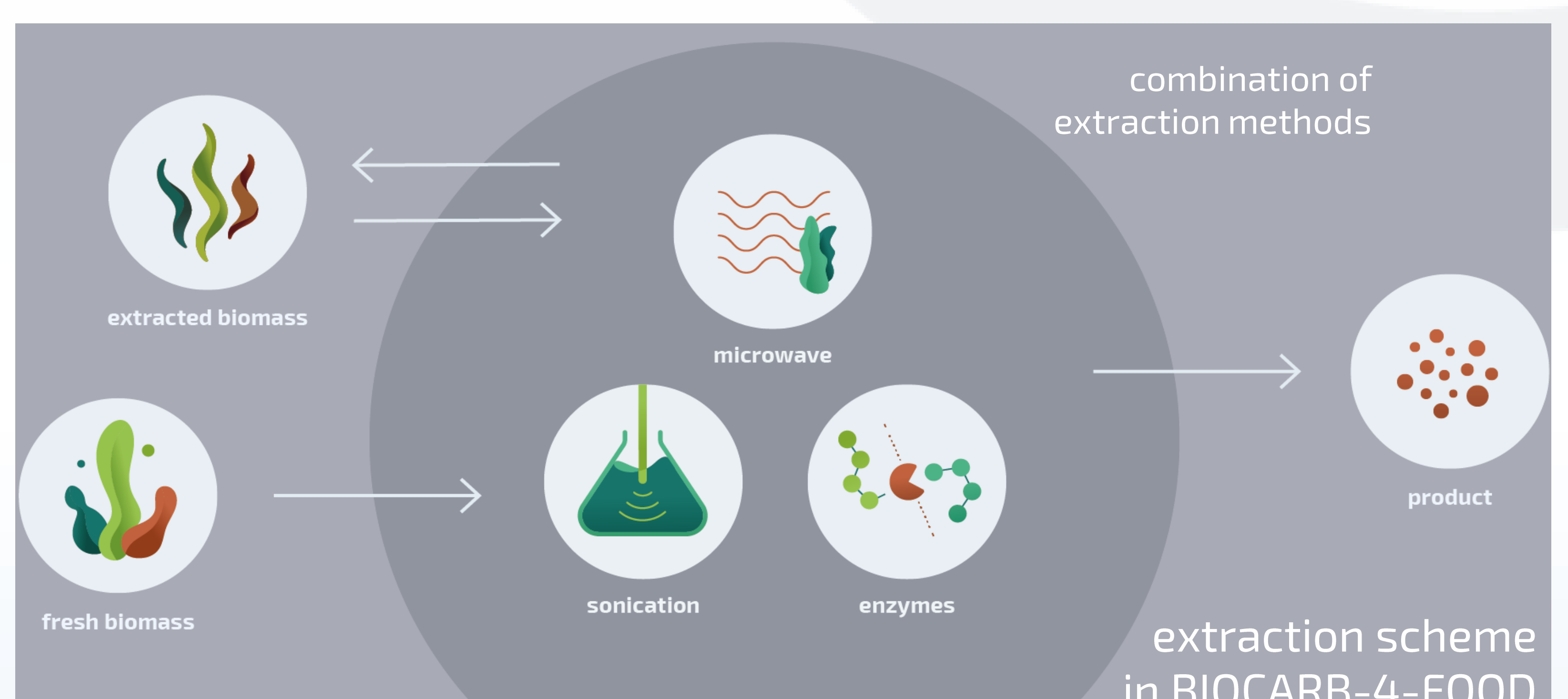*Gelidium sesquipedale*  *Ascophyllum nodosum*  *Alaria esculenta*  *Laminaria saccharina*  *Posidonia oceanica*

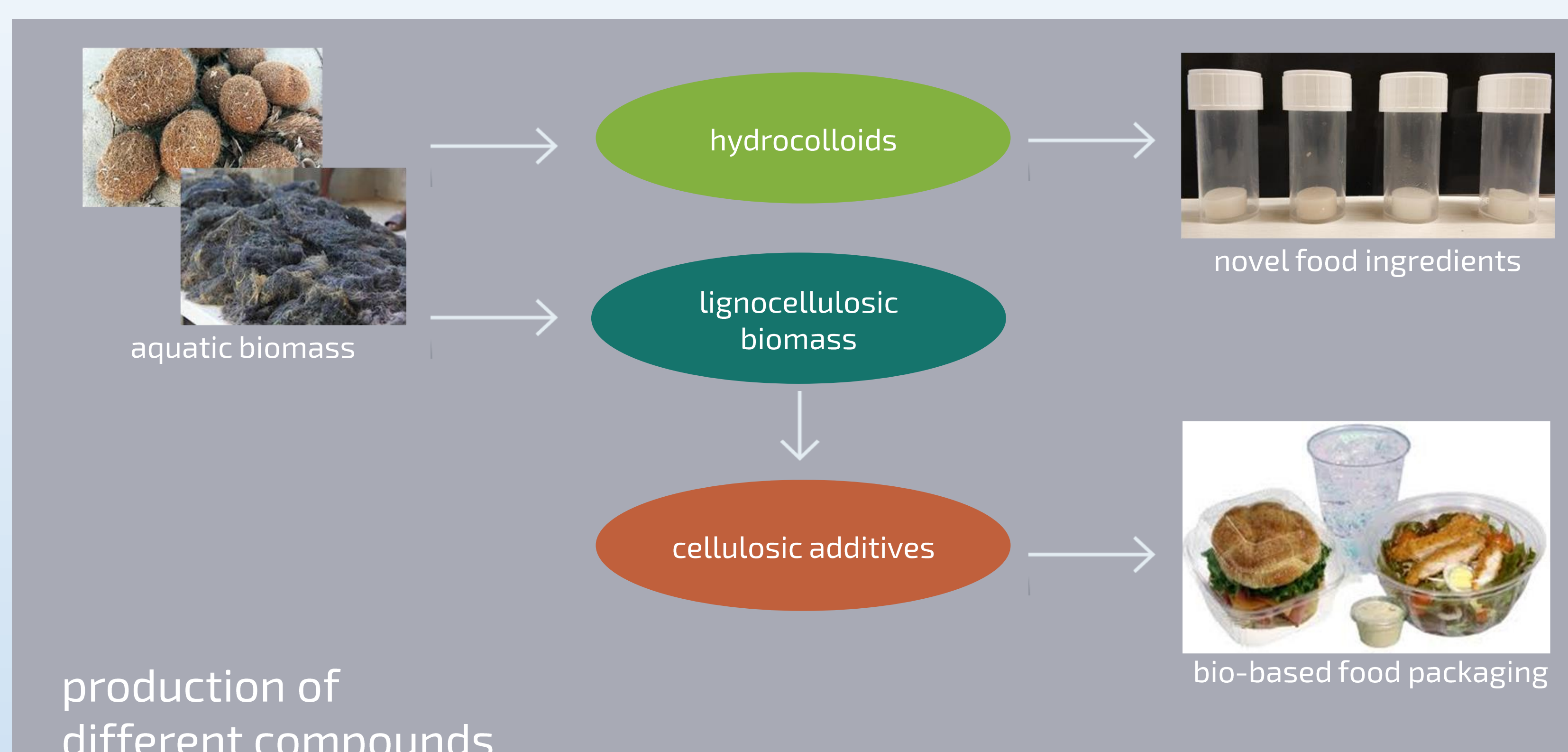Agar-rich extracts, lignocellulosic fractions from the residue

Alginate-rich extracts, lignocellulosic fractions from the residue

Lignocellulosic fractions, bioactive extracts

**ACTION** In collaboration with industry, environmentally friendly and efficient extraction techniques are explored and combined with the exploitation of remaining bio-mass, rich in bioactive compounds, to obtain novel carbohydrate-based extracts and fiber (nanocellulose). Structure, technological properties, toxicity and bio-activity of the extracted fractions are characterized and a life cycle assessment is conducted for proving sustainability of the procedures.
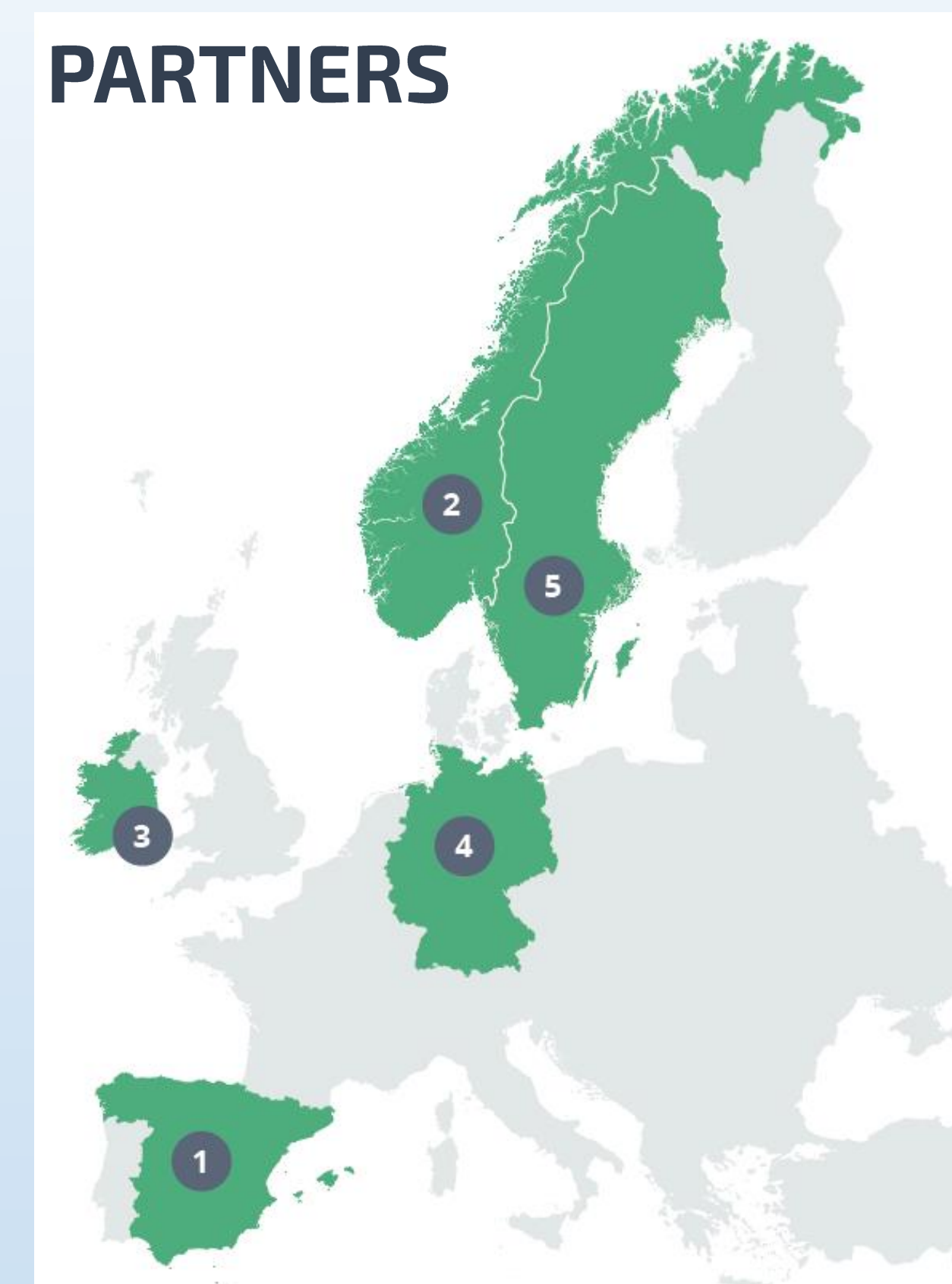


extracted biomass

fresh biomass

microwave

sonication

enzymes

combination of extraction methods

product

extraction scheme in BIOCARB-4-FOOD

Schematic sketch: used extraction procedures



aquatic biomass

hydrocolloids

lignocellulosic biomass

cellulosic additives

novel food ingredients

bio-based food packaging

production of different compounds

Schematic sketch: educts, intermediate and products

**PARTNERS**



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