# Boreal Green Bioeconomy 2016-2020

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### Growth and well-being from sustainable bioeconomy



**People – Competence – Collaboration – Infrastructure – Platforms** 

LUKE

# **Boreal green bioeconomy**

### **MISSION**

Boreal Green Bioeconomy generates scientific knowledge and solutions for increasing sustainable forest and field biomaterials supply in the boreal region

### VISION

Scientific knowledge and solutions produced by Boreal Green Bioeconomy are boosting boreal region to a leading role in sustainable bioeconomy.

This position is based on innovative value-chains from raw material production to value-added end-products benefitting the society.





## **Boreal Green Bioeconomy at Luke**

### 5. Bioeconomy products, services and value chains

- Wood products industries
- Green building concepts and urbanization
- Wild forest products
- Services from nature-based well-being and health

### **1.Biomass production**

- Intensification of bioproduction
- Abiotic and biotic risk management
- Precision breeding

## 3. Harvesting and logistics

- Digitalization and big data
- Supply chain and logistics
- Machine concepts
- Human-machine interactions

# 4. Biorefineries and industrial symbioses

- Biorefinery potential of biomass
- Biomass conversion technologies
- Industrial symbioses and biocircular economy

### 2. Resource-smart planning and decision making

- Data on demand
- Regional scenarios
- Land use optimization and closure of yield gaps
- Sustainability, acceptability and biodiversity



## Funding

- Luke research portfolio about 75 ME
- Boreal green 34 ME (about 45% of total research portfolio)
- Own funding 58%



# Forest bioeconomy research at Luke – addressing holistic sustainability



# Forest 150 - tools



Development of toolbox for intensive forest growth



## Multidisciplinary forest bioeconomy research for the future

- Tree bark, (fruit and root vegetable peels and legume pods)
  - as functional surfaces
  - antioxidants and antimicrobial agents for food and feed link to Innofood programme
- Sawdust
  - as raw material for fish feed link to Innofood programme
  - Increased protein self-sufficiency
  - more value for sawdust instead of burning it
- Organic side flows and waste
  - production of volatile fatty acids
  - nutrient recycling,
- Willow
  - production of **biochar**
  - Green building, carbon sink



# Challenges and possibilities in Forest bioeconomy research

### • End-product driven primary production

- Collaboration through the whole value-chain important
- Luke's campus strategy supporting this
- Direct industrially funded customer projects limited despite of clear needs
  - New collaboration models implemented, e.g. PPP-projects

### H2020 work programmes

- forest bioeconomy issues less visible
- Lobbying together with Nordic countries (SWE) needed
- Luke active member in Helsinki EU office
- Strengthening Nordic research area in boreal bioeconomy





## VMI12: Puuston kasvu noussut edelleen – Pohjois-Suomessa metsät järeytyvät

## Puuston tilavuus

Puuston vuotuinen kasvu

**2 464** milj m<sup>3</sup> (VMI11 2356 milj m<sup>3</sup>) **109,9** milj m<sup>3</sup> (VMI11 105,5 milj m<sup>3</sup>) 015) => neliäsosa kasvusta

Kokonaispoistuma 82 milj m<sup>3</sup> (2015) => neljäsosa kasvusta puustopääomaan

### Lahopuuston määrä

E-S: 4,3 m<sup>3</sup>/ha (3,8 m<sup>3</sup>/ha) P-S: 7,3 m<sup>3</sup>/ha (8,0 m<sup>3</sup>/ha) Koko maa: 5,7 m<sup>3</sup>/ha (5,7 m<sup>3</sup>/ha)

### Metsienhoidon rästit lisääntyvät

- taimikonhoitorästit 795 000 ha
- Nuoren metsän hoitorästit vajaat miljoona ha



